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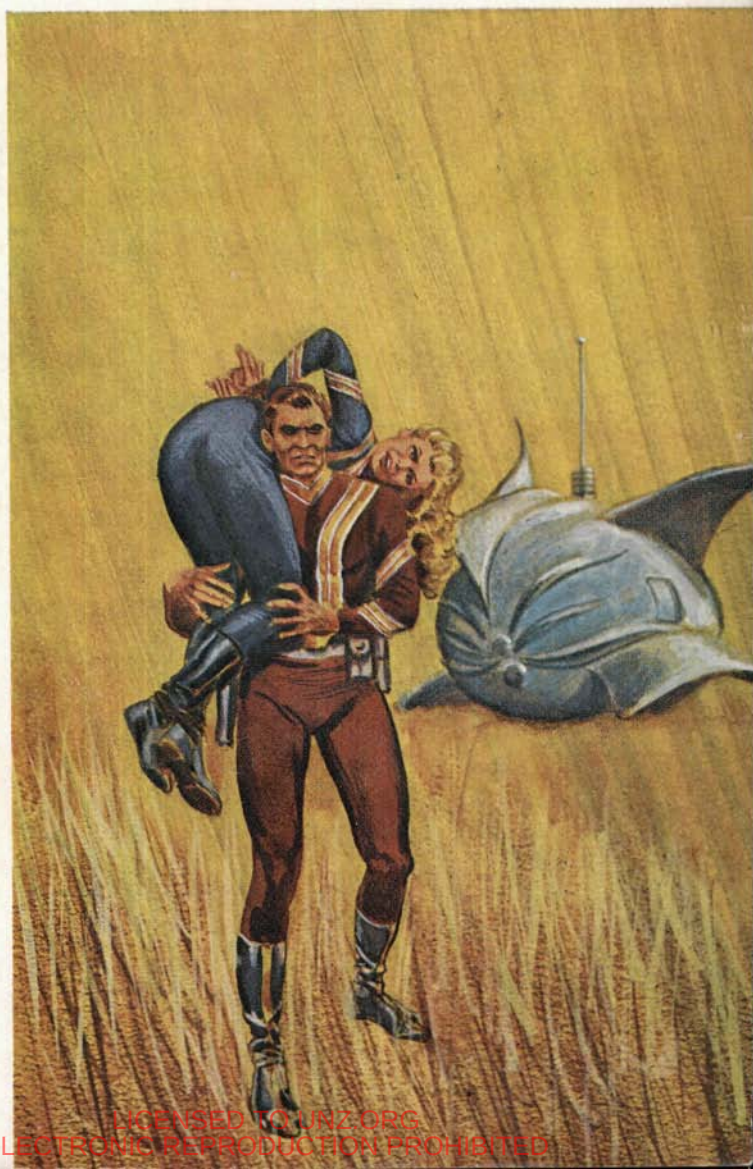

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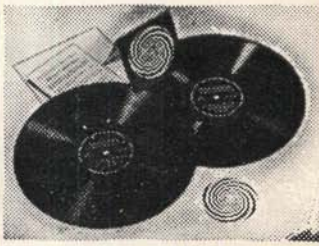

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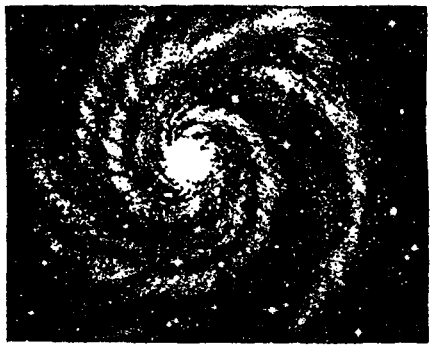

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GALAXY MAGAZINE is published *bi-monthly* by *Galaxy Publishing* Corporation. Main offices: 421 Hudson Street, New York, N.Y. 10014. 60c per copy Subscription: (12 copies) $6.00 per year in the United States, Canada, Mexico, South and Central America and U. S. Posessions. Elsewhere $7.00. Second-class postage paid at New York, N.Y. and at additional mailing offices. Copyright New York 1966 by Galaxy Publishing Corporation, Robert M Guinn, President. All rights including translations reserved. All material submitted must be accompanied by self-addressed stamped envelopes. The publisher assumes no responsibility for unsolicited material. All stories printed in this magazine are fiction and any similiarity between characters and actual persons is coincidental.
Printed in the U.S.A.
By The Guinn Co., Inc. N. Y
Title Reg. U. S. Pat. Off.

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Looking Ahead to 1965

The other day we got a note from Horace Gold, enclosing a ten-year-old clipping with the suggestion that we might want to write an editorial about it. He was right. We do. The clipping came from *Coronet,* issue of October, 1955; it was an article entitled *A Look at Your Life — Ten Years from Today.* It was written by Leo Cherne, executive director of the Research Institute of America, "as told to" Ray Joseph — meaning that Joseph did the writing on the basis of what Cherne predicted.

What did Cherne predict? "The sun will heat your house, a jet engine will power your two cars — and atomic radiation will preserve food in a kitchen that disappears," said *Coronet*'s blurb. So far the score is zero; but as we go deeper into the article we come across a lot of better guesses. Trans-Atlantic jet travel in five hours? Right on the nose. Wide use of contraceptive pills? Check. Color television sets costing $300 or less? Very close; they're coming onto the market now.

Short of reprinting the whole article, it is hard to select the exact predictions that succeeded and those that failed and compile a box score, but in general for every guess that was wrong about the technology of "tomorrow", there was at least one other guess that was amazingly right.

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Solar-heated houses, jet automobile engines, nuclear-powered ocean liners — wrong; but plastic back-yard swimming pools, "increasingly complex business machines" and space vehicles in orbit, absolutely right. Mr. Cherne looks very good as a prophet . . . until you come to consider another class of predictions made in his 1955 forecast. For example, these:

"The most profound change to take place in the world will be the elimination of world war . . . You will have peace."

"By 1965, the U.S. will have come successfully through a depression in which 6,000,000 will have been unemployed."

"Strikes will be rare."

As anyone who reads the daily newspapers knows, we don't have peace, we didn't have the depression . . . and we do have strikes. Oh, that we do; lots of them.

What went wrong?

Perhaps the difference is as simple as the difference between the "hard" sciences and the "soft" ones — technology is intrinsically predictable, social changes are intrinsically not. But even if we don't have a science of social behavior, it is useful to try to observe patterns if they exist; and there is a glimmering of a pattern here. Why do we not have peace? Because the nations of the world decline to give up any meaningful part of their God-given right to do whatever they, in their own sole judgment, think they might enjoy. Why do we still have staggeringly costly strikes? Because trade unions and employers behave no more sensibly than foreign ministers.

But why did we not have the depression? Because as soon as one threatened, and each time one threatened, government spending and government tax relief was increased to flood the economy with money.

Of Cherne's social predictions that went wrong, two rested on his opinion that large groups would order their activities on the basis of long-range results. He was optimistic, and he was wrong. The third rested on his estimate that a similar large group could not respond quickly enough to a short-range challenge. But it did.

We human beings do pretty well with emergencies. Not so well with planning ahead.

Isn't it about time we began looking a little deeper into consequences? Or, as someone said at a recent convention of business leaders, "Can't we find time to act on what is important, instead of what is merely urgent?"

— THE EDITOR

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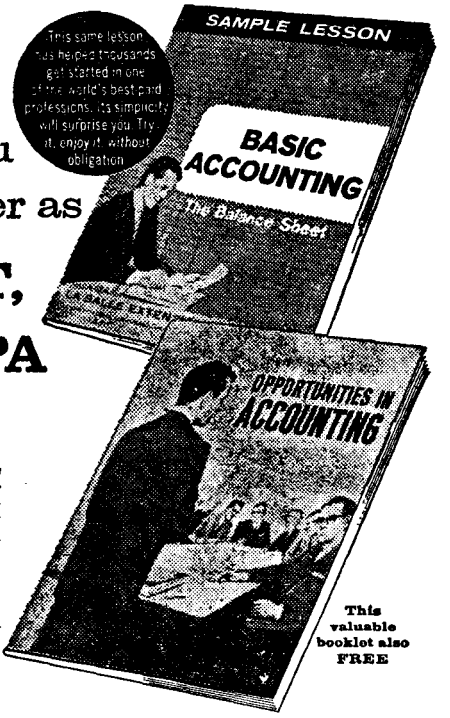
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PART ONE

HEISENBERG'S

The Optimen could kill any man in the world, or all of them. But Something killed Optimen!

I

They would schedule a rain for this morning, Dr. Thei Svengaard thought. *Rain always makes the parents uneasy . . . not to mention what it does to the doctors.*

A gust of winter wetness rattled against the window behind his desk. He stood, thought of muting the windows, but the Durants—this morning's parents—might be even more alarmed by the unnatural silence on such a day.

Dr. Svengaard stepped to the window, looked down at the thronging foot traffic—day shifts going to their jobs in the megal-

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EYES

by FRANK HERBERT

Illustrated by ADKINS

opolis, night shifts headed toward their tumbled rest. There was a sense of power and movement in the comings and goings of the people in spite of their troglodyte existence. Most of them, he knew, were childless Sterries . . . sterile. They came and they went, numbered, but numberless.

He had left the intercom open to his reception room and he could hear his nurse, Mrs. Washington, distracting the Durants with questions and forms.

Routine.

That was the watchword. This must all appear normal, casual routine. The Durants and all the others fortunate enough to be chosen *and* to become parents must never suspect the truth.

Dr. Svengaard steered his mind away from such thoughts, reminding himself that guilt was not a permissible emotion for a member of the medical profession. Guilt led inevitably to betrayal . . . and betrayal brought messy consequences. The Optimen were exceedingly touchy where the breeding program was concerned.

Such a thought with its hint of criticism filled Svengaard with a

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momentary disquiet. He swallowed and allowed his mind to dwell on the Folk response to the Optimen: *They are the power that loves us and cares for us.*

With a sigh, he turned away from the window, skirted the desk and went through the door that led via the ready room to the lab. In the ready room, he paused to check his appearance in the mirror: gray hair, dark brown eyes, strong chin, high forehead and rather grim lips beneath an aqualine nose. He'd always been rather proud of the remote dignity in his appearance-cut and had come to terms with the need of adjusting the remoteness. Now, he softened the set of his mouth, practiced a look of compassionate interest.

Yes, that would do for the Durants — granting the accuracy of their emotional profiles.

Nurse Washington was just ushering the Durants into the lab as Dr. Svengaard entered through his private door. The skylights above them drummed and hissed with the rain. Such weather suddenly seemed to fit the room's mood: washed glass, steel, plasmeld and tile . . . all impersonal. It rained on everyone. And all humans had to pass through a room such as this . . . even the Optimen.

Dr. Svengard took an instant dislike to the parents. Harvey Durant was a lithe six-footer with curly blond hair, light blue eyes. The face was wide with an apparent innocence and youth. Lizbeth, his wife, stood almost the same height, equally blonde, equally blue-eyes and young. Her figure suggested valkyrie robustness. On a silver cord around her neck she wore one of the omnipresent Folk talismen, a brass figure of the female Optiman, Calapine. The breeder cult nonsense and religious overtones of the figures did not escape Dr. Svengaard. He suppressed a sneer.

The Durants were parents, however, and robust — living testimony to the skill of the surgeon who had cut them. Dr. Svengaard allowed himself a moment of pride in his profession. Not many people could enter the tight little group of subcellular engineers who kept human variety within bounds.

Nurse Washington paused in the door behind the Durants, said: "Dr. Svengaard, Harvey and Lizbeth Durant." She left without waiting for acknowledgements. Nurse Washington's timing and discretion always were exquisitely correct.

"The Durants, how nice," Dr. Svengaard said. "I hope my nurse didn't bore you with all those forms and questions. But I

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guess you knew you were letting yourselves in for all that routine when you asked to watch. Didn't you?"

"We understand," Harvey Durant said. And he thought: *Asked us to watch, indeed! If this old fake thinks he can pull his little tricks on us, he's got a surprise coming!*

Dr. Svengaard noted the rich, compelling baritone of the man's voice. It bothered him and added to his dislike of the couple standing before him.

"We don't want to take any more of your time than absolutely necessary," Lizbeth said.

She clasped her husband's hand and through their secret code of finger pressures said: *Do you read him? He doesn't like us.*

Harvey's fingers responded: *He's a Sterrie prig, so full of pride in his position that he's half blind. But we know our rights and won't let him take advantage of us.*

The woman's no-nonsense tone annoyed Dr. Svengaard. She already was staring around the lab with quick, searching looks. *I must keep control here,* he thought. He crossed to them and shook hands. Their palms were sweaty. To the experienced doctor, this was an excellent sign.

Nervous. Good, Dr. Svengaard thought.

The sound of a viapump at his left seemed reassuringly loud to him then. You could count on the pump to make parents nervous. That was why the pumps were loud. Dr. Svengaard turned toward the sound, indicated a sealed crystal vat on a force-field stand near the lab's center. The pump sound came from the vat.

"Here we are," Dr. Svengaard said.

Lizbeth stared at the vat's milky transluscent surface. She wet her lips with her tongue. "In there?"

"And as safe as can be," Dr. Svengaard said.

He cherished the small hope then that the Durants might yet leave, go home and await the outcome.

Harvey took his wife's hand, patted it. He, too, stared at the vat. "We understand you've called in this specialist," he said.

"Dr. Potter," Svengaard said. "From Central." He glanced at the nervous movements of the Durants' hands, noting the omnipresent tatooed index fingers which announced their gene type and station. They could add the coveted "V" for viable now, he thought, and he suppressed a momentary jealousy.

"Dr. Potter, yes," Harvey

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said. Through their hands, he signaled Lizbeth: "*Notice how he said Central?*"

How could I miss it? she asked.

Central, she thought. The place conjured pictures of the lordly Optimen, but this made her think of the Cyborgs who secretly opposed the Optimen, and the whole thing filled her with profound disquiet. She could afford to think of nothing but her son now.

"We know Potter's the best there is," she said, "and we don't want you to think we're just being emotional and fearful . . ."

". . . but we're going to watch," Harvey said. And he thought: *This stiff-necked surgeon had better realize we know our legal rights.*

"I see," Dr. Svengaard said. *Damn these fools!* he thought. But he held his voice to a soothing monotone as he said: "Your concern is a matter of record. I admire it. However, the consequences . . ."

He left the words hanging there, reminding them that he had legal rights, too. He could make the cut with or without their permission, and couldn't be held responsible for any upset to parents. Public Law 10927 was clear and direct. Parents might invoke it for the right to watch, but the cut *would* be made at the surgeon's discretion. The human race had a planned future which excluded genetic monsters and wild deviants.

Harvey nodded, a quick and emphatic motion. He gripped his wife's hand tightly. Bits of Folk horror stories and official myths trickled through his mind. He saw Svengaard partly through this confusion of stories and partly through the clandestine forbidden literature grudgingly provided by the Cyborgs to the Parents Underground — through Stedman and Merck, through Shakespeare and Huxley. His youth had fed on such a limited past that he knew superstition could not help but remain.

Lizbeth's nod came slower. She knew what their chief concern here had to be, but that was still her son in the vat.

"Are you sure," she asked, deliberately baiting Svengaard, "that there's no pain?"

The extent of the Folk nonsense which bred in the necessary atmosphere of popular ignorance filled Dr. Svengaard with resentment. He knew he'd have to end this interview quickly. The things he might be saying to these people kept intruding in his awareness, interfering with what he *had* to say.

"That fertilized ovum has no nerve trains," he said. "It's physically less than three hours old,

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its growth retarded by controlled nitrate respiration. Pain? The concept doesn't apply."

The technical terms would have little meaning to them, Dr. Svengaard knew — other than to emphasize the distance between mere parents and a submolecular engineer.

"I guess that was rather foolish of me," Lizbeth said. "The . . . it's so simple, not really like a human yet." And she signaled to Harvey through their hands: *What a simpleton he is! As easy to read as a child.*

Rain beat a tarantella against the skylight. Dr. Svengaard waited it out, then: "Ah, now — let us make no mistakes." And he thought what an excellent moment it was to give these fools a catechism refresher. "Your embryo may be less than three hours old, but it already contains every basic enzyme it'll need when fully developed. An enormously complicated organism."

Harvey stared at him in assumed awe at the *greatness* which could understand such mysteries as the shaping and moulding of life.

II

Two days ago, selected gametes from Harvard and herself had been united there, gripped in stasis, allowed to go through limited mitosis. The process had produced a viable embryo — not too common a thing in their world where only a select few were freed of the contraceptive gas and allowed to breed and only a rare number of those produced viables. She wasn't supposed to understand the intricacies of the process, and the fact that she did understand had to be hidden at all times. *They* — the genetic Optimen of Central — stamped savagely on the slightest threat to their supremacy. And *they* considered knowledge in the wrong hands to be the most terrible threat.

"How . . . big is . . . he now?" she asked.

"Diameter less than a tenth of a millimeter," Dr. Svengaard said. He relaxed his face into a smile. "It's a morula and back in the primitive days it wouldn't yet have completed its journey to the uterus. This is the stage when it's most susceptible to us. We must do our work now before the formation of the trophoblast."

The Durants nodded in awe.

Dr. Svengaard basked in their respect. He sensed their minds fumbling over poorly remembered definitions from the limited schooling they'd been permitted. Their records said she was a creche librarian and he an instructor of the young — not much education required for either.

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Harvey touched the vat, jerked his hand away. The crystal surface felt warm, filled with subtle vibrations. And there was that constant *thrap-thrap-thrap* of the pump. He sensed the deliberateness of that annoying sound, reading, the way he'd been trained in the Underground, the subtle betrayals in Svengaard's manner. He glanced around the laboratory. Glass pipes, square gray cabinets, shiny angles and curves of plasmeld, omnipresent gauges like staring eyes. The place smelled of disinfectants and exotic chemicals. Everything about the lab carried that calculated double purpose — functional in design but constructed in such as way as to awe the uninitiated.

Lizbeth focused on the one mundane feature of the place she could recognize for certain — a tile sink with gleaming faucets. The sink sat squeezed between two mysterious constructions of convoluted glass and dull gray plasmeld.

The sink bothered Lizbeth. It represented a place of disposal. You flushed garbage into a sink for grinding before it was washed into the sewage reclamation system. Anything small could easily be dumped into a sink and lost.

Forever.

Anything.

"I'm not going to be talked out of watching," she said.

Damn! Dr. Svengaard thought. *There was a catch in her voice.* That little catch, that hesitation was betrayal. It didn't fit with her bold appearance. Overemphasis on maternal drive in her cutting . . . no matter how successful the surgeon had been with the rest of her.

"Our concern is for you as much as for your child," Dr. Svengaard said. "The trauma . . ."

"The law gives us the right," Harvey said. And he signaled to Lizbeth: *The whole pattern's more or less what we anticipated.*

Trust this clod to know the law, Dr. Svengaard thought. He sighed. Statistical prediction said one in one hundred thousand parents would insist despite all the subtle and not so subtle pressures against it. Statistics and visible fact, however, were two distinct matters. Svengaard had noted how Harvey glared at him. The man's cutting had been strong on male protectiveness — too strong, obviously. He couldn't stand to see his *mate* thwarted. Doubtless he was an excellent provider, model husband, never participated in Sterrie orgies — a leader.

A Clod.

"The law," Dr. Svengaard said, and his voice dripped rebuke,

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"also requires that I point out the dangers of psychological trauma to the parents. I was *not* suggesting I'd try to prevent you from watching."

"We're going to watch," Lizbeth said.

Harvey felt a surge of admiration for her then. She played her role so beautifully, even to that catch in her voice.

"I couldn't stand the waiting otherwise," Lizbeth said. "Not knowing . . ."

Dr. Svengaard wondered if he dared press the matter — perhaps an appeal to their obvious awe, a show of Authority. One look at Harvey's squared shoulders and Lizbeth's pleading eyes dissuaded him. They were going to watch.

"Very well," Dr. Svengaard sighed.

"Will we watch from here?" Harvey asked.

Dr. Svengaard was shocked. "Of course not!" What primitives, these clods! But he tempered the thought with realization that such ignorance resulted from the carefully fostered mystery that surrounded gene shaping. In a calmer tone, he said: "You'll have a private room with a closed-circuit connection to this lab. My nurse will escort you."

Nurse Washington proved her competence then by appearing in the doorway. She'd been listening, of course. A good nurse never left such matters to chance.

"Is this all we get to see here?" Lizbeth asked.

Dr. Svengaard heard the pleading tone, noted the way she avoided looking directly at the vat. All his pent-up scorn came out in his voice as he said: "What else is there to see, Mrs. Durant? Surely you didn't expect to see the morula."

Harvey tugged at his wife's arm, said: "Thank you, Doctor."

Once more, Lizbeth's eyes scanned the room, avoiding the vat. "Yes, thank you for showing us . . . this room. It helps to see how . . . prepared you are for . . . every emergency." Her eyes focused on the sink.

"You're quite welcome, I'm sure," Dr. Svengaard said. "Nurse Washington will provide you with the list of permissable names. You might occupy part of your time choosing a name for your son if you've not already done so." He nodded to the nurse. "See the Durants to Lounge Five, please."

Nurse Washington said: "If you'll follow me, please?" She turned with that air of overworked impatience which Svengaard suspected all nurses acquired with their diplomas. The Durants were sucked up in her wake.

Svengaard turned back to the vat.

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So much to do — Potter, the specialist from Central, due within the hour . . . and he wouldn't be happy about the Durants. People had so little understanding of what the medical profession endured. The psychological preparation of parents subtracted from time better devoted to more important matters . . . and it certainly complicated the security problem. Svengaard thought of the five "Destroy After Reading" directives he'd received from Max Allgood, Central's boss of T-Security during the past month. It was disturbing, as though some new danger had set Security scurrying.

But Central insisted on the socializing with parents. The Optimen must have good reason, Svengaard felt. Most things *they* did made wonderful sense. Sometimes, Svengaard knew, he fell into a feeling of orphanage, a creature without past. All it took to shake him from the emotional morass, though, was a moment's contemplation: *They are the power that loves us and cares for us. They* had the world firmly in their grip, the future planned — a place for every man and every man in his place. Some of the old dreams — space travel, the questing philosophies, farming of the seas — had been shelved temporarily, put aside for more important things. The day would come, though, once *they* solved the unknowns behind submolecular engineering.

Meanwhile, there was work for the willing — maintaining the population of workers, suppressing deviants, husbanding the genetic pool from which even the Optimen sprang.

Svengaard swung the meson microscope over the Durant vat, adjusted for low amplification to minimize Heisenberg interference. One more look wouldn't hurt, just on the chance he might locate the pilot-cell and reduce Potter's problem.

Even as he bent to the scope, Svengaard knew he was rationalizing. He couldn't resist another search into this morula which had the potential, might be shaped into an Optiman. The wonderous things were so rare. He flicked the switch, focused.

A sigh escaped him: "Ahhh —"

So passive the morula at low amplification; no pulsing as it lay within the stasis — yet so beautiful in its semi-dormancy . . . so little to hint that it was the arena of ancient battles.

Svengaard put a hand to the amplification controls, hesitated. High amplification posed its dangers, but Potter could readjust minor marks of meson interference. And the *big* look was very tempting.

He doubled amplification.

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Enlargement always reduced the appearance of stasis. Things moved here, and in the unfocused distances there were flashes like the dartings of fish. Up out of the swarming arena came the triple spiral of nucleotides that had led him to call Potter. Almost Optiman. Almost that beautiful perfection of form and mind that could accept the indefinite balancing of Life through the delicately adjusted enzyme prescriptions.

A sense of loss pervaded Svengaard. His own prescription, while it kept him alive, was slowly killing him. It was the fate of all men. They might live two hundred years, sometimes even more . . . but in the end the balancing act failed for all except the Optimen. They were perfect, limited only by their physical sterility, but that was the fate of many humans and it subtracted nothing from endless life.

His own childless state gave Svengaard a sense of communion with the Optimen. *They'd* solve that, too . . . some day.

He concentrated on the morula. A sulfur-containing amino acid dependency showed faint motion at this amplification. With a feeling of shock, Svengaard recognized it — isovalthine, a genetic marker for latent myxedema, a warning of potential thyroid deficiency. It was a disquieting flaw in the otherwise near-perfection Potter would have to be alerted.

Svengaard backed off amplification to study the mitochondrial structure. He followed out the invaginated unit-membrane to the flattened, sac-like cristae, returned along the external second membrane, focused on the hydrophilic outer compartment. Yes . . . the isovalthine was susceptible to adjustment. Perfection might yet be for this morula.

Flickering movement appeared at the edge of the microscope's field.

Svengaard stiffened, thought: *Dear God, no!*

He stood frozen at the viewer as a thing seen only eight previous times in the history of geneshaping took place within his field of vision.

A thin line like a distant contrail reached into the cellular structure from the left. It wound through a coiled-coil of alpha helices, found the folded ends of the polypeptide chains in a myosin molecule, twisted and dissolved.

Where the trail had been now lay a new structure about four Angstroms in diameter and a thousand Angstroms long — sperm protamine rich in arginine. All around it the protein factories of the cytoplasm were undergoing change, fighting the stasis,

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realigning. Svengaard recognized what was happening from the descriptions of the eight previous occurences. The ADP-ATP exchange system was becoming more complex — "resistant." The surgeon's job had been made infinitely more complex.

Potter will be furious, Svengaard thought.

Svengaard turned off the microscope, straightened. He wiped perspiration from his hands, glanced at the lab clock. Less than two minutes had passed. The Durants weren't even in their lounge yet. But in those two minutes, some force . . . some energy from *outside* had made a seemingly purposeful adjustment within the embryo.

Could this be what's stirred up Security . . . and the Optimen? Svengaard wondered.

He had heard this thing described, read the reports . . . but actually to have seen it himself! To have seen it . . . so sure and purposeful . . .

He shook his head. *No! It was not purposeful! It was merely an accident, chance, nothing more.*

But the vision wouldn't leave him.

Compared to that, he thought. *how clumsy my efforts are. And I'll have to report it to Potter. He'll have to shape that twisted chain . . . if he can now that it's resistant.*

Full of disquiet, not at all satisfied that he had seen an accident, Svengaard began making the final check of the lab's preparations. He inspected the enzyme racks and their linkage to the computer dosage-control. Plenty of cytochrome b_5 and P-450 hemoprotein, a good reserve store of ubiquinone and sulfhydryl, arsenate, azide and oligomycin, sufficient protein-bound phosphohistidine. He moved down the line — acylating agents, a store of (2, 4-dinitrophenol) and the isoxazolidon-3 groups with reduction NADH.

He turned to the physical equipment, checked the meson scalpel's micromechanism, read the life-system gauges on the vat and the print-out of the stasis mechanism.

All in order.

It had to be. The Durant embryo, that beautiful thing with its wondrous potential, was now *resistant* — a genetic unknown . . . if Potter could succeed where others had failed.

III

Dr. Vyaslav Potter stopped at the Records Desk on his way into the hospital. He was faintly tired after the long tube-shunt from Central to Seatac Megalopolis; still he told an off-color joke about primitive reproduc-

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tion to the gray-haired duty nurse. She chuckled as she hunted up Svengaard's latest report on the Durant embryo. She put the report on the counter, stared at Potter.

He glanced at the folder's cover, looked up to meet the nurse's eyes.

Is it possible? he wondered. *But . . . no. She's too old. Wouldn't even make a good playmate. Anyway, the bigdomes wouldn't grant us a breeding permit.* And he reminded himself: *I'm a Zeek . . . a* $J^{4}11118^{2}K$. The Zeek gene-shaping had gone through a brief popularity in the region of Timbuctu Megalopolis during the early nineties. It produced curly black hair, a skin one shade lighter than milk chocolate, soft brown eyes and a roly-poly face of utmost benignity, all on a tall, strong body. A Zeek. A Vyaslav Potter.

It had yet to produce an Optiman, male or female, and never a viable gamete match.

Potter had long since given up. He was one of those who'd voted to discontinue the Zeek. He thought of the Optimen with whom he dealt and sneered at himself: *There but for the brown eyes . . .* But the sneer no longer gave him a twinge of bitterness.

"You know," he said, smiling at the nurse, "these Durants whose Emb I have this morning — I cut them both. Maybe I've been in this business too long."

"Oh, go on with you, Doctor," she said with an arch turn of her head. "You're not even middle-aged. You don't look a day over a hundred."

He glanced at the folder. "But here are these kids bringing me their emb to cut and I . . ." He shrugged.

"Are you going to tell them?" she asked. "I mean that you had them, too."

"I probably won't even see them," he said. "You know how it is. Anyway, sometimes people are unhappy with their cut. Sometimes they wish they'd had a little more of this, less of that. They tend to blame the surgeon. They don't understand, *can't* understand the problems we have in the cutting room."

"But the Durants seem like a very successful cut," she said. "Normal. Happy. Perhaps a little over-worried about their son, but . . ."

"Their genotype is one of the most successful," he said. He tapped the record folder with a forefinger. "Here's the proof: they had a viable with potential." He lifted a thumb in the time-honored gesture for Optiman.

"You should be very proud of them," she said. "My family's had only fifteen viables in a hundred

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and eighty-nine years, and never an . . ." She repeated Potter's thumb gesture.

He pursed his lips into a *moue* of commiseration, wondering how he let himself get drawn into these conversations with women, especially with nurses. It was that little seed of hope that never died, he suspected. It was cut from the same stuff that produced the wild rumors, the quack "breeder doctors" and the black market in "true breed" nostrums. It was the thing that sold the little figurines of Optiman-Calapine because of the unfounded rumor that she had produced a viable. It was the thing that wore out the big toes of fertility idols from the kisses of the hopeful.

His *moue* of commiseration became a cynical sneer. *Hopeful! If they only knew.*

"Were you aware the Durants are going to watch?" the Nurse asked.

His head jerked up and he glared at her.

"It's all over the hospital," she said. "Security's been alerted. The Durants've been scanned and they're in Lounge Five with closed circuit to the cutting room."

Anger blazed through him. "Damn it to hell! Can't they do anything right here?"

"Now, Doctor," she said, stiffening into the prim departmental

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dictator. "There's no call to lose your temper. The Durants quoted the law. That ties our hands and you know it."

"Stupid damn law," Potter muttered, but his anger had subsided. *The law!* he thought. *More of the damn masquerade.* He had to admit, though, that they needed the law. Without Public Law 10927, people might ask the wrong kinds of questions. And no doubt Svengaard had done his bumbling best to try to dissuade the Durants.

Potter assumed a rueful grin, said: "Sorry I snapped like that. I've had a bad week." He sighed. "They just don't understand."

"Is there any other record you wish, Doctor?" she asked.

Rapport was gone, Potter saw. "No, thanks," he said. He took the Durant folder, headed for Svengaard's office. Just his luck: a pair of watchers. It meant plenty of extra work. Naturally!

The Durants couldn't be content with seeing the tape *after* the cut. Oh, no. *They* had to be on the scene. That meant the Durants weren't as innocent as they might appear — no matter what this hospital's Security staff said. The public just did not insist any more. That was supposed to've been cut out of them.

The statistical few who defied their genetic shaping now required special attention.

And Potter reminded himself: *I did the original cut on this pair. There was no mistake.*

He ran into Svengaard outside the latter's office, heard the man's quick resume. Svengaard then began babbling about his Security arrangements.

"I don't give a damn what your Security people say," Potter barked. "We've new instructions. Central Emergency's to be called in every case of this kind."

They went into Svengaard's office. It pretended to be wood paneling — a corner room with a view of flowered roof gardens and terraces built of the omnipresent three-phase regenerative plasmeld, the "plasty" of the Folk patois. Nothing must age or degenerate in this best of all Optiman worlds. Nothing except people.

"Central Emergency?" Svengaard asked.

"No exceptions," Potter said. He sat in Svengaard's chair, put his feet on Svengaard's desk and brought the little ivory-colored phone box to his stomach with its screen only inches from his face. He punched in Security's number and his own code identification.

Svengaard sat on a corner of the desk across from him appearing both angry and cowed.

"They were scanned, I tell

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you," Svengaard said. "They were carrying no unusual devices. There's nothing unusual about them."

"Except they insist on watching," Potter said. He jiggled the phone key. "What's keeping those ignoramuses?"

Svengaard said: "But the law . . ."

"Damn the law!" Potter said. "You know as well as I do that we could route the view signal from the cutting room through an editing computer and show the parents anything we want. Has it ever occurred to you to wonder why we don't do just that?"

"Why . . . they . . . ahh . . ." Svengaard shook his head. The question had caught him off balance. Why wasn't that done? The statistics showed a certain number of parents would insist on watching and . . .

"It was tried," Potter said. "Somehow, the parents detected the computer's hand in the tape."

"How?"

"We don't know."

"Weren't the parents questioned and . . ."

"They killed themselves."

"Killed them . . . How?"

"We don't know."

"*We don't know!*" Potter echoed sarcastically.

A heavy masculine voice came from the phone: "Who're you talking to?"

Potter focused on the screen, said: "I was talking to Sven. This viable he called me on . . ."

"It is a viable?"

"Yes! It's a viable with the full potential, but the parents insist on watching."

"I'll have a full crew on the way by tube in ten minutes," said the voice on the phone. "They're at Friscopolis. Shouldn't take 'em more than a few minutes."

Svengaard rubbed dry palms against the sides of his working smock. He couldn't see that face on the phone, but the voice sounded like Max Allgood, T-Security's boss.

"We'll delay the cut until your people get here," Potter said. "The records are being faxed to you and should be on your desk in a few minutes. There's another . . ."

"Is that embryo everything we were told?" asked the man on the phone. "Any flaws?"

"A latent myxedema, a projective faulty heart valve, but the—"

"Okay, I'll call you after I've seen the . . ."

"Damn it to hell!" Potter erupted. "Will you let me get ten words out of my mouth without interrupting?" He glared into the screen. "There's something here more important than flaws and the parents." Potter glanced up at Svengaard, back to the screen. "Sven reports he saw an *outside*

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adjustment of the arginine deficiency."

A low whistle came from the phone, then: "Reliable?"

"Depend on it."

"Did it follow the pattern of the other eight?"

Potter glanced up at Svengaard, who nodded.

"Sven says yes."

"*They* won't like that."

"*I* don't like it."

"Did Sven see enough to get any . . . new ideas on it?"

Svengaard shook his head.

"No," Potter said.

"There's a strong possibility it isn't significant," the man on the phone said. "In a system of increasing determinism . . ."

"Oh, yes," Potter sneered. "In a system of increasing determinism you get more and more indeterminism. You might as well say in a foofram of increasing haggersmaggle . . ."

"Well, it's what *they* believe," he said.

"So they say. *I* believe Nature doesn't like being meddled with."

Potter stared into the screen. For some reason, he recalled his youth, the beginning of his medical studies and the day he'd learned how *very* close his genotype had been to the Optiman. He found that the old core of hatred had become mildly amused tolerance and cynicism.

"I don't see why they put up with you," the man on the phone said.

"Because I was *very* close," Potter whispered. He wondered then how close the Durant embryo would be. *I'll do my best,* he thought.

The man on the phone cleared his throat, said: "Yes, well I'll depend on you to handle things at your end. The embryo ought to provide some verification of the outside inter . . ."

"Don't be a total ass!" Potter snapped. "The emb will bear out Svan's report to the last enzyme. You tend to your job; we'll do ours." He slapped the cut-off, pushed the phone back onto the desk and sat staring at it. "Pompous damned . . . no — he's what he is because he's what he is. Comes from living too close to *them.* Comes from the original cut. Maybe I'd be an ass too if that's what I had to be," he observed cynically.

Svengaard tried to swallow in a dry throat. He'd never before heard such an argument or such frank talk from the men who operated out of Central. He was more than a little surprised.

"Shocked you, eh, Sven?" Potter asked. He dropped his feet to the floor and waited for the man in front of him to answer.

Svengaard shrugged. He felt ill at ease.

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IV

Potter studied the man. Svengaard was good within his limits, but he lacked creative imagination. A brilliant surgeon, but without that special quality he was often a dull too.

"You're a good man, Sven," Potter said. "Dependable. That's what your record says, you know. Dependable. You'll never be anything else. Weren't meant to be. In your particular niche, though, you're *it*."

Svengaard heard only the praise, said: "It's good to be appreciated, of course, but . . ."

"But we have work to do."

"It will be difficult," Svengaard said. "Now."

"Do you think that *outside* adjustment was an accidental thing?" Potter asked.

"I . . . I'd like to believe that . . ." Svengaard wet his lips with his tongue. ". . . it wasn't determined, that no agency . . ."

"You'd like to lay it to uncertainty, to Heisenberg," Potter said. "The principle of uncertainty. Some result of our own meddling. Everything an accident in the capricious universe."

Svengaard felt stung by a quality of harshness in Potter's voice, said: "Not precisely. I meant only that I hoped no super casual agency had a hand in it."

"God? You don't really mean you're afraid this is the action of a deity?"

Svengaard looked away. "I remember in school," he said. "You were lecturing. You said we always have to be ready to face the fact that the reality we see will be shockingly different from anything our theories led us to suspect."

"Did I say that? Did I really say that?"

"You did."

"Something's out there, eh? Something beyond our instruments. It's never heard of Heisenberg. It isn't uncertain at all. It moves." His voice lowered. "It moves directly. It adjusts things." He cocked his head to one side. "Ah, hah! The ghost of Heisenberg is confounded!"

Svengaard glared at Potter. The man was mocking him. He spoke stiffly: "Heisenberg did point out that we have our limits."

"You're right," Potter said. "There's a caprice in our universe. He taught us that. There's always something we can't interpret or understand . . . or measure. He set us up for this present dilemma, eh?" Potter glanced at his finger watch, back to Svengaard. "We tend to interpret everything around us by screening it through that system which is native to us. Our civilization sees indeterminately through the eyes

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of Heisenberg. If he taught us truly, how can we tell whether the unknown's an accident or the deliberate intent of God? What's the use of even asking?"

Svengaard spoke defensively: "We appear to manage . . . somehow."

Potter startled him by laughing, head tipped back, body shaking with enjoyment. The laughter subsided and presently Potter said: "Sven, you are a gem. I mean that. If it weren't for the ones like you, we'd still be back in the muck and mire, running from glaciers and saber-tooth tigers."

Svengaard fought to keep anger from his voice, said: "What do *they* think this arginine adjustment is?"

Potter stared at him, measuring, then: "Damned if I haven't underestimated you, Sven. Apologies, eh?"

Svengaard shrugged. Potter was acting oddly today — astonishing reactions, strange eruptions of emotion. Do you *know* what they say about this?" he asked.

"You heard Max on the phone," Potter said.

So that was Allgood, Svengaard thought.

"Certainly, I know," Potter growled. "Max has it all wrong. *They* say gene-shaping inflicts itself on nature — on a nature that can never be reduced to mechanical systems and, therefore, to stationary matter. You can't stop the movement, see? It's an extended system phenomenon, energy seeking a level."

"Extended system?" he asked.

Potter looked up at the man's scowling face. The question focused Potter's attention abruptly on the differences in thought patterns between those who lived close to Central and those who touched the Optiman world only through reports and second-hand associations.

We are so different, Potter thought. *Just as the Optimen are different from us and Sven here is different from the Sterries and breeders. We're cut off from each other . . . and none of us has a past. Only the Optimen have a past. But each has an individual past . . . selfishly personal . . . and ancient.*

"Extended system," Potter said. "From the microcosmos to the macrocosmos, *they* say all is order and systems. The *idea* of matter is insubstantial. All is collisions of energy — some appearing large, swift and spectacular, some small, gentle and slow. But this too is relative. The aspects of energy are infinite. Everything depends on the viewpoint of the observer. For each change of viewpoint, the energy rules change. There exists an infinite

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number of energy rules, each set dependent on the twin aspects of viewpoint and background. In an extended system, this *thing* from outside assumes the aspect of a node appearing on a standing wave. That's what *they* say."

Svengaard slipped off the desk, stood in a rapture of awe. He felt that he'd had a fleeting glimpse, a wisp of understanding that penetrated every question he might ask about the universe.

Could that be what it's like to work out of Central? he wondered.

"That's a great summation, isn't it?" Potter demanded. He stood up. "A truly *great* idea!" A chuckle shook him. "You know, a guy named Diderot had that idea. It was around 1750 or thereabout. *They* spoon-feed it to us now. Great wisdom!"

"Maybe Diderot was one of *them*," Svengaard ventured.

Potter sighed, thinking: *How ignorant a man can become on a diet of managed history.* He wondered then how his own diet had been adjusted and managed.

"Diderot was one of us," Potter growled.

Svengaard stared at him, shocked to silence by the man's blasphemy.

"It comes down to this," Potter said. "Nature doesn't like being meddled with."

A chime sounded beneath Svengaard's desk.

"Security?" Potter asked.

"That's the all clear," Svengaard said. "They're ready for us now."

"Central's Security hotshots are all in place," Potter said. "You will note that they didn't stoop to report to you or to me. They watch us too, you know."

"I've nothing to hide," Svengaard said.

"Of course you haven't," Potter said. He moved around the desk, threw an arm across Svengaard's shoulders. "Come along. It's time for us to put on the mask of Archeus. We're going to give form and organization to a living body. Veritable gods, we are."

Svengaard felt himself still lost in confusion. "What'll *they* do to the Durants?" he asked.

"Do? Not a damn thing, unless the Durants force it. The Durants won't even know they're being watched. But Central's little boys will know everything that goes on in that lounge. The Durants won't be able to belch without the gas being subjected to a full and complete analysis. Come along."

But Svengaard held back. "Dr. Potter," he asked, "what do *you* think introduced that arginine chain into the Durant morula?"

"I'm closer to you than you

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think," Potter said. "We're fighting . . . instability. We've upset the biological stability of the inheritance patterns with our false isomers and our enzyme adjustments and our meson beams. We've underminded the chemical stability of the molecules in the germ plasm. You're a doctor. Look at the enzyme prescriptions we all have to take — how profound the adjustment we have to make to stay alive. It wasn't always that way. And *whatever* set up that original stability is still in there fighting. *That*'s what I think."

V

The cutting-room nurses positioned the vat under the enzyme console, readied the tubes and the computer-feed-analysis board. They worked quietly and efficiently as Potter and Svengaard examined the gauges. The computer nurse racked her tapes and there came a brief whirring as she tested her board.

Potter felt himself filled with the wakeful anxiety that always came over him before surgery. He knew it would give way presently to the charged sureness of action, but he felt snappish at the moment. He glanced at the vat gauges. The Krebs cycle was holding at 86.9, a good sixty points above death level. The vat nurse came over to examine his breather mask. He checked his microphone: "Mary had a little lamb — its fleece was black as hades — the surgeon took the credit for — a joke on all the ladies."

He heard a distinct chuckle from the computer nurse, glanced at her, but she had her back to him and her face already hidden by hood and mask.

The vat nurse said: "Microphone working, Doctor."

He couldn't see her lips moving behind her mask, but her cheeks rippled as she spoke.

Svengaard flexed his fingers in their gloves, took a deep breath. It smelled faintly of ammonia. He wondered why Potter always joked with the nurses. It seemed demeaning, somehow.

Potter moved across to the vat. His sterile suit crinkled with a familiar snapping hiss as he walked. He glanced up at the wall screen, the replay monitor which showed approximately what the surgeon saw and which was the view watched by the parents. The screen presented him with a view of itself as he turned his forehead pickup lens toward it.

Damn parents, he thought. *They make me feel guilty.*

He returned his attention to the crystal vat now bristling with instruments. The pump's churgling annoyed him.

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Svengaard moved to the other side of the vat, waiting. The breather mask hid the lower half of his face, but his eyes appeared calm. He radiated a sense of steadiness and reliability.

How does he really feel? Potter wondered. And he reminded himself that in an emergency there wasn't a better cutting-room assistant than Sven.

"You can begin increasing the pyruvic acid," Potter said.

Svengaard nodded, depressed the feeder key.

The computer nurse started her reels turning.

They watched the gauges as the Krebs cycle began rising — 87.0 . . . 87.3 . . . 87.8 . . . 88.5 . . . 89.4 . . . 90.5 . . . 91.9 . . .

Now, Potter told himself, the irreversible movement of growth has started. Only death can stop it. "Tell me when the Krebs cycle reaches one hundred and ten," he said.

He swung the scope and micro-manipulators into place, leaned into the rests. *Will I see what Sven saw?* he wondered. He knew it wasn't likely. The lightning from *outside* had never struck twice in the same place. It came. It did what no human hand could do. It went away.

Where? Potter wondered.

The inter-ribosomal gaps swam into focus. He scanned them, boosted amplification and went down into the DNA spirals. Yes — there was the situation Sven had described. The Durant embryo was one of those that could cross over into the more-than-human land of Central . . . if the surgeon succeeded.

The confirmation left Potter oddly shaken. He shifted his attention to the mitochondrial structures, saw the evidence of the arginine intrusion. It squared precisely with Sven's description. Alpha-helices had begun firming up, revealing the telltale striations at the aneurin shifts. This one was going to resist the surgeon. This was going to be a tough one.

Potter straightened.

"Well?" Svengaard asked.

"Pretty much as you described it," Potter said. "A straightforward job." That was for the watching parents.

He wondered then what Security was discovering about the Durants. Would this pair be loaded down with search and probe devices disguised as conventional artifacts? Possibly. But there were rumors of new techniques being introduced by the Parents Underground . . . and of Cyborgs moving out of the dark shadows which had hidden them for centuries. If there were Cyborgs at all. Potter was not convinced.

Svengaard spoke to the com-

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puter nurse: "Start backing off the pyruvic."

"Backing off pyruvic," she said.

Potter swung his attention to the priority rack beside him, checked the presentation — in the first row the pyrimidines, nucleic acids and proteins, then aneurin, riboflavin, pyridoxin, pantothenic acid, folic acid, choline, inositol, sulfhydryl . . .

He cleared his throat, lining up his plan for the attack on the morula's defenses. "I will attempt to find a pilot cell by masking the cysteine at a single locus," he said. "Stand by with sulfhydryl and prepare an intermediary tape for protein synthesis."

"Ready for masking," Svengaard said. He nodded to the computer nurse who racked the intermediary tape into position with a smooth sureness.

"Krebs cycle?" Potter asked.

"One hundred and ten coming up," Svengaard said.

Silence.

"Mark," Svengaard said.

Again Potter bent to the scope. "Begin the tape," he said. "Two minims of sulfhydryl."

Slowly Potter increased amplification, chose a cell for the masking. The momentary clouding of intrusion cleared away and he searched the surrounding cells for clues that mytosis would take off on his *directed* tangent. It was slow . . . slow. He'd just begun and his hands felt sweaty in their gloves.

"Stand by with adenosine triphosphate," he said.

Svengaard presented the feeder tube in the micromanipulators, nodded to the vat nurse. ATP already. This *was* going to be a tough one.

"Begin one minim ATP," Potter said.

Svengaard depressed the feeder key. The whirring of the computer tapes sounded overly loud.

Potter lifted his head momentarily, shook it. "Wrong cell," he said. "We'll try another one. Same procedure."

Again he leaned into the scope and the rests, moved the micromanipulators, pushing amplification up a notch at a time. Slowly he traced his way down into the cellular mass. *Gently . . . gently . . .* The scope itself could cause irreversible damage in here.

Ahhh, he thought, recognizing an active cell deep in the morula. Vat-stasis had produced only a relative slowing in here. The cell was the scene of intense chemical activity. He recognized doubled base pairs strung on a convoluted helix of sugar phosphate as they passed his field of vision.

His beginning anxiety had passed and he felt the old sureness with the often repeated sen-

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sation that the morula was an ocean in which he swam, that the cellular interior was his natural habitat.

"Two minims of sulfhydryl," Potter said.

"Sulfhydryl, two minims," Svengaard said. "Standing by with ATP."

"ATP," Potter said, then: "I'm going to inhibit the exchange reaction in the mitochondrial systems. Start oligomycin and azide."

Svengaard proved his worth then by complying without hesitation. The only sign that he recognized the dangers in this procedure was a question: "Shall I have an uncoupling agent ready?"

"Stand by with arsenate in number one," Potter said.

"Krebs cycle going down," the computer nurse said. "Eighty-nine point four."

"Intrusion effect," Potter said. "Give me point six minim of azide."

Svengaard depressed the key.

"Point four minim oligomycin," Potter said.

"Oligomycin, point four," Svengaard said.

Potter felt that he lived now only through his eyes on the microscope and his hands on the micromanipulators. His existence had moved into the morula, fused with it.

His eyes told him that peripheral mitosis had stopped . . . as it should under these ministrations. "I *think* we have it," he said. He planted a marker on the scope position, shifted focus and went down into the DNA spirals, seeking the hydroxyl deformity, the flaw that would produce a faulty heart valve. Now he was the artist, the master cutter. The pilot cell was determined. Now he moved to reshape the delicate chemical factory of the inner structure.

"Prepare for the cut," he said.

Svengaard armed the meson generator. "Armed," he said.

"Krebs cycle seventy-one," the computer nurse said.

"First cut," Potter said. He let off the single, aimed burst, watched the tumbling chaos that followed. The hydroxyl appendage vanished. Nucleotides reformed.

"Hemprotein P-450," Potter said. "Stand by to reduce it with NADH." He waited, studying the globular proteins that formed before him, watching for biologically active molecules. *Now!* Instinct and training combined to tell him the precise instant. "Two and a half minims of P-450," he said.

A corner of turmoil engaged a group of polypeptide chains in the heart of the cell.

"Reduce it," Potter said.

Svengaard touched the NADH

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feeder key. He couldn't see what Potter saw, but the surgeon's forehead lens reproduced a slightly off-parallax view of the scope field. That plus Potter's instructions told of the slow spread of change in the cell.

"Krebs cycle fifty-eight," the computer nurse said.

"Second cut," Potter said.

"Armed," Svengaard said.

Potter searched out the myxedema-latent isovalthine, found it. "Give me a tape on structure," he said. "S-(isopropylcarboxymethyl) cystein."

Computer tape hissed through the reels, stopped, resumed at a slow, steady pace. The isovalthine comparison image appeared in the right quadrant of Potter's scope field. He compared the structures, point for point, said: "Tape off." The comparison image vanished.

"Krebs cycle forty-seven," the computer nurse said.

Potter took a deep, trembling breath. Another twenty-seven points and they'd be in the death range. The Durant embryo would succumb.

He swallowed, aimed off the meson burst.

Isovalthine tumbled apart.

"Ready with cycloserine," Svengaard said.

Ahhh, good old Sven, Potter thought. *You don't have to tell him every step what to do.*

"Comparison on D-4-aminoisoxazolidon-3," Potter said.

The computer nurse readied the tape, "Comparison ready."

The comparison image appeared in Potter's view field. "Check," he said. The image vanished. "One point eight minims." He watched the interaction of the enzymic functional groups as Svengaard administered the cycloserine. The amino group showed a nice, open field of affinity. Transfer-RNA fitted readily into its niches.

"Krebs cycle thirty-eight point six," the computer nurse said.

We'll have to chance it, Potter thought. *This embryo won't take more adjustment.*

"Reduce vat stasis to half," he said. "Increase ATP. Give me micro-feed on ten minims of pyruvic acid."

"Reducing stasis," Svengaard said. And he thought: *This will be close.* He keyed the ATP and pyruvic acid feeders.

"Give me the Krebs cycle on the half point," Potter said.

"Thirty-five," the nurse said. "Thirty-four point five. Thirty-four. Thirty-three point five." Her voice picked up speed with a shocked, breathlessness: "Thirty-three . . . thirty-two . . . thirty-one . . . thirty . . . twenty-nine . . ."

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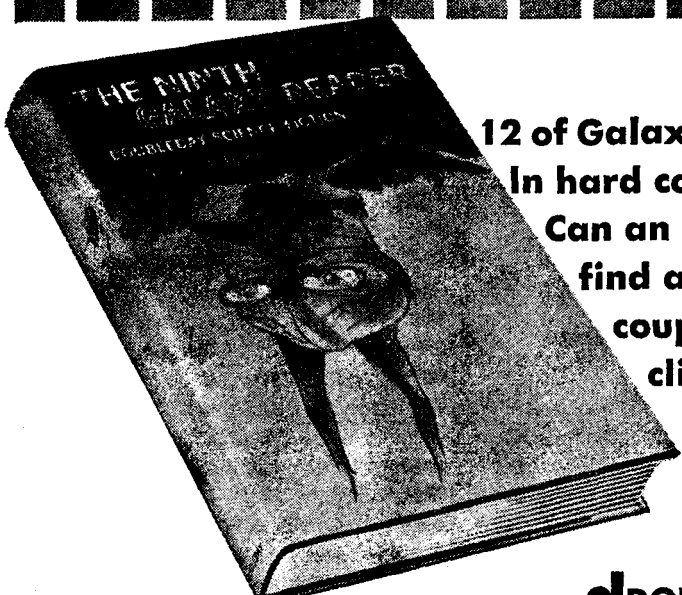

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"Release all stasis," Potter said. "Present the full amino spectrum with activated histidine. Start pyridoxin — four point two minims."

Svengaard's hands sped over the keys.

"Back-feed the protein tape," Potter ordered. "Give it the full DNA record on computer automatic."

Tapes hissed through the reels.

"It's slowing," Svengaard said.

"Twenty-two," the computer nurse said. "Twenty-one nine . . . twenty-two . . . twenty-one nine . . . twenty-two one . . . twenty-two two . . . twenty-two one . . . twenty-two two . . . Twenty-two three . . . twenty-two four . . . twenty-two three . . . twenty-two four . . . twenty-two five . . . twenty-two six . . . twenty-two five . . .

Potter felt the see-saw battle through every nerve. The morula was down at the edge of the death range. It could live or it could die in the next few minutes. Or it could come out of this crippled. Such things happened. When the flaw was too gross, the vat was turned off, flushed out. But Potter felt an identification with this embryo now. He felt he couldn't afford to lose it.

"Mutagen desensitizer," he said.

Svengaard hesitated. The Krebs cycle was following a slow sine curve that dipped perilously into the death cycle now. He knew why Potter had made this decision, but the carcinogenic peril of it had to be weighed. He wondered if he should argue the step. The embryo hung less than four points from a deadly plunge into dissolution. Chemical mutagens administered at this point could shock it into a spurt of growth or destroy it. Even if the mutagen treatment worked, it could leave the embryo susceptible to cancer.

"Mutagen desensitizer!" Potter repeated.

"Dosage?" Svengaard asked.

"Half minim on fractional-minim feed. I'll control it from here."

Svengaard shifted the feeder keys, his eyes on the Krebs-cycle repeater. He'd never heard of applying such drastic treatment this close to the borderline. Mutagens usually were reserved for the partly-flawed Sterrie embryo, a move that sometimes produced dramatic results. It was like shaking a bucket of sand to level the grains. Sometimes the germ plasm presented with a mutagen sought a better level on its own. They'd even produced an occasional viable this way . . . but never an Optiman.

Potter reduced amplification, studied the flow of movement in the embryo. Gently, he depressed

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the feeder key, searched for Optiman signs. The cellular action remained unsteady, partly blurred.

"Krebs cycle twenty-two eight," the computer nurse said.

Climbing a bit, Potter thought.

"Very slow," Svengaard said.

Potter maintained his vigil within the morula. It was growing, expanding in fits and starts, fighting with all the enormous power concentrated in its tiny domain.

"Krebs cycle thirty point four," Svengaard said.

"I am withdrawing mutagens," Potter said. He backed off the microscope to a peripheral cell, desensitized the nucleo-proteins, searched for the flawed configurations.

The cell was clean.

Potter traced down into the coiled-coil helices of the DNA chains with a dawning wonder.

"Krebs cycle thirty-six eight and climbing," Svengaard said. "Shall I start the choline and aneurin?"

Potter spoke automatically, his attention fixed on the cell's gene structure. "Yes — start them." He completed the scope tracing, shifted to another peripheral cell.

Identical.

Another cell — the same.

The altered gene pattern held true, but it was a pattern, Potter realized, which hadn't been seen in humankind since the second century of gene shaping. He thought of calling for a comparison to be sure. The computer would have it, of course. No record was ever lost or thrown away. But he dared not . . . there was too much at stake in this. He knew he didn't need the comparison, though. This was a classic form, a classroom norm which he had stared at almost daily all through his medical education.

The super-genius pattern that had caused Sven to call in a Central specialist was there, firmed up by the cuttingroom adjustments. It was close-coupled, though, with a fully stable fertility pattern. The longevity basics lay locked in the configurations of the gene structure.

If this embryo reached maturity and encountered a fertile mate, it could breed healthy, living children without the interference of the gene surgeon.

It needed no enzyme prescription to survive. It would outlive ten standard humans without that prescription . . . and with a few delicate enzymic adjustments might join the ranks of the immortals.

The Durant embryo could father a new race — like the live-forevers of Central, but dramatically unlike them. This em-

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bryo's progeny might fit themselves into the rhythms of natural selectivity . . . completely outside Optiman control.

It was the template pattern from which no human could deviate too far and live, yet it was the single thing feared most by Central.

Every gene surgeon had this drummed into him during his education: *Natural selectivity is a madness that sends its human victims groping blindly through empty lives.*"

Optiman reason and Optiman logic, must, of necessity, do the selecting.

As though he straddled Time, Potter felt the profound certainty that the Durant embryo, if it matured, *would* encounter a fertile mate. This embryo had received a gift from *outside* — a wealth of sperm-arginine, the key to its fertility pattern. In the flood of mutagen which opened the active centers of the DNA, this embryo's gene patterns had shaken down into a stable form no human dared attempt.

Why did I introduce the mutagens just then? Potter wondered. *I knew it was the needed thing. How did I know? Could I have been an instrument of some other force?*

"Krebs cycle fifty-eight and climbing steadily," Svengaard said.

Potter longed for the freedom to discuss this problem with Svengaard . . . but there were the damnable parents and the Security people . . . watching. Was it possible anyone else had seen enough and knew enough of this pattern to realize what had happened here? he wondered.

Why did I introduce the mutagens?

"Can you see the pattern yet?" Svengaard asked.

"Not yet," Potter lied.

The embryo was growing rapidly now. Potter studied the proliferation of stable cells. It was beautiful.

"Krebs cycle sixty-four seven," Svengaard said.

I've waited too long, Potter thought. *The bigdomes of central will ask why I waited so long to kill this embryo. I cannot kill it! It's too beautiful.*

Central maintained its power by keeping the world at large in ignorance of the ruling fist, by doling out living time in the form of precious enzyme prescriptions to its half-alive slaves.

The Folk had a saying: *In this world there are two worlds — one that works not and lives forever; one that lives not and works forever.*

Here in a crystal vat lay a tiny ball of cells, a living creature less than six-tenths of a millimeter in diameter, and it carried the full

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potential of living out its life beyond Central's control.

This morula had to die.

They'll order it killed, Potter thought. *And I will be suspect, finished. And if this thing did get loose in the world, what then? What would happen to gene surgery? Would we go back to correcting minor defects . . . the way it was before we started shaping supermen?*

Supermen!

In his mind, he did what no voice could do: he cursed the Optimen. They were enormous power, instant life or death. Many were geniuses. But they were as dependent on the enzymic fractions as any clod of the Sterries or Breeders. There were men as brilliant among the Sterries and Breeders . . . and among the surgeons.

But none of these could live forever, secure in that ultimate, brutal power.

"Krebs cycle one hundred even," Svengaard said.

"We're over the top now," Potter said. He risked a glance at the computer nurse, but she had her back to him, fussing with her board. Without that computer record, it might be possible to conceal what had happened here. With that record open to examination by Security and by the Optimen, it could not be hidden. Svengaard had not seen enough. The forehead lense only approximated the full field vision. The vat nurses couldn't even guess at it. Only the computer nurse with her tiny monitor screen might know . . . and the full record lay in her machine now — a pattern of magnetic waves on strips of tape.

VI

"That's the lowest I've ever seen it go without killing the embryo," Svengaard said.

"How low?" Potter asked.

"Twenty-one nine," Svengaard said. "Twenty's bottom, of course, but I've never heard of an embryo coming back from below twenty-five before, have you?"

"No," Potter said.

"Is it the pattern we want?" Svengaard asked.

"I don't want to interfere too much yet," Potter said.

"Of course," Svengaard said. "Whatever happens, it was inspired surgery."

Inspired surgery! Potter thought. *What would this dolt say if I told him what I have here? A totally viable embryo! A total. Kill it, he'd say. It'll need no enzyme prescription and it can breed true. It hasn't a defect . . . not one. Kill it, he'd say. He's a dutiful slave. The whole sorry history of gene shaping could be justified by this one*

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embryo. But the minute they see this tape at Central, the embryo will be destroyed.

Eliminate it, they'll say . . . because they don't like to use words too close to kill or death.

Potter bent to the scope. How lovely the embryo was in its own terrifying way.

He risked another glance at the computer nurse. She turned, mask down, met his gaze, smiled. It was a knowing, secretive smile, the smile of a conspirator. Now she reached up to mop the perspiration from her face. Her sleeve brushed a switch. A rasping, whirring scream came from the computer board. She whirled to it, grated: "Oh, my God!" Her hands sped over the board, but tape continued to hiss through the transponder plates. She turned, tried to wrestle the transparent cover from the recording console. The big reels whirled madly under the cover plate.

"It's running wild!" she shouted.

"It's locked on erase!" Svengaard yelled. He jumped to her side, tried to get the cover plate off. It jammed in its tracks.

Potter watched like a man in a trance as the last of the tape flashed through the heads, began whipping on the take-up reels.

"Oh, Doctor, we've lost it!" the computer nurse wailed.

Potter focused on the little monitor screen at the computer nurse's station. *Did she watch the operation closely?* he asked himself. *Sometimes they follow the cut move by move . . . and computer nurses are a savvy lot. If she watched, she'll have a good idea what we achieved. At the very least, she'll suspect. Was that tape erasure really an accident? Do I dare?*

She turned, met his gaze. "Oh, Doctor, I'm so sorry," she said.

"It's all right, nurse," Potter said. "There's nothing very special about this embryo now — aside from the fact that it will live."

"We missed it, eh?" Svengaard asked. "Must've been the mutagens."

"Yes," Potter said. "But without them it would have died."

Potter stared at the nurse. He couldn't be sure, but he thought he saw a profound relief wash over her features.

"I'll cut a verbal tape of the operation," Potter said. "That should be enough on this embryo."

And he thought: *When does a conspiracy begin? Was this such a beginning?*

There was still so much this conspiracy required. No knowledgeable eye could ever again look at this embryo through the microscope without being a part of the conspiracy . . . or a traitor.

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"We still have the protein synthesis tape," Svengaard said. "That'll give us the chemical factors by reference — and the timing."

Potter thought about the protein synthesis tape. Was there danger in it? No. It was only a reference for what had been used in the operation . . . not *how* anything had been used.

"So it will," Potter said. "So it will." He gestured to the monitor screen. "Operations finished. You can cut the direct circuit and escort the parents to the reception room. I'm very sorry we achieved no more than we did, but this'll be a healthy human."

"Sterrie?" Svengaard asked.

"To soon to guess," Potter said. He looked at the computer nurse. She had managed to get the cover off at last and had stopped the tapes. "Any idea how that happened?"

"Probably solenoid failure," Svengaard said.

"This equipment's quite old," the nurse said. "I've asked for replacement units several times, but we don't seem to be very high on the priority lists."

And there's a natural reluctance at Central to admit anything can wear out, Potter thought.

"Yes," Potter said. "Well, I daresay you'll get your replacements now."

Did anyone else see her trip that switch? Potter wondered. He tried to remember where everyone in the room had been looking, worried that a Security monitor might've been watching her. *If Security saw that, she's dead,* Potter thought. *And so am I.*

"The technician's report on repairs will have to be part of the record on this case," Svengaard said. "I presume you'll . . ."

"I'll see to it personally, Doctor," she said.

Turning away, Potter had the impression that he and the computer nurse had just carried on a silent conversation. He noted that the big screen was now a gray blank, the Durants no longer watching. *Should I see them myself?* he wondered. *If they're part of the Underground, they could help. Something has to be done about the embryo. Safest to get it out of here entirely, but how?*

"I'll take care of the tie-off details," Svengaard said. He began checking the vat seals and life systems repeaters, dismantling the meson generator.

Someone has to see the parents, Potter thought.

"The parents'll be disappointed," Svengaard said. "They generally know why a specialist is called in . . . and probably got their hopes up."

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The door from the ready room opened to admit a man Potter recognized as an agent from Central Security. He was a moon-faced blond with features one tended to forget five minutes after leaving him. The man crossed the room to stand in front of Potter.

Is this the end for me? Potter wondered. He forced his voice into a steady casual tone, asked: "What about the parents?"

"They're clean," the agent said. "No tricky devices — conversation normal — plenty of small talk, but normal."

"No hint of the other things?" Potter asked. "Anyway they could've penetrated Security without instruments?"

"Impossible!" the man snorted.

"Doctor Svengaard believes the father's overly endowed with male protectiveness and the mother has too much maternalism," Potter said.

"The records show you shaped 'em," the agent said.

"It's possible," Potter said. "Sometimes you have to concentrate on gross elements of the cut to save the embryo. Little things slip past."

"Anything slip past on this one today?" the agent asked. "I understand the tape's been erased . . . an accident."

Does he suspect? Potter asked himself. The extent of his own involvement and personal danger threatened to overwhelm Potter. It took the greatest effort to maintain a casual one.

"Anything's possible of course," Potter said. He shrugged. "But I don't think we have anything unusual here. We lost the Optishape in saving the embryo, but that happens. We can't win them all."

"Should we flag the embryo's record?" the agent asked.

He'll still fishing, Potter told himself. He said: "Suit yourself. I'll have a verbal tape on the cut pretty soon — probably just as accurate as the visual one. You might wait and analyze that before you decide."

"I'll do that," the agent said.

Svengaard had the miscroscope off the vat now. Potter relaxed slightly. No one was going to take a casual, dangerous look at the embryo.

"I guess we brought you on a wild goose chase," Potter said. "Sorry about that, but they did insist on watching."

"Better ten wild goose chases than one set of parents knowing too much," the agent said. "How was the tape erased?"

"Accident," Potter said. "Worn equipment. We'll have the technical report for you shortly."

"Leave the worn equipment thing out of your report," the

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agent said. "I'll take that verbally. Allgood has to show every report to the Tuyere now."

Potter permitted himself an understanding nod. "Of course." The men who worked out of Central knew about such things. One concealed personally disquieting items from the Optimen.

The agent glanced around the cutting room, said: "Some day we won't have to use all this secrecy. Won't come any too soon for me." He turned away.

Potter watched the retreating back, thinking how neatly the agent fitted into the demands of his profession. A superb cut with just one flaw. Too neat a fit, too much cold logic, not enough imaginative curiosity and readiness to explore the avenues of chance.

If he'd pressed me, he'd have had me, Potter thought. *He should've been more curious about the accident. But we tend to copy our masters — even in their blind spots.*

Potter began to have more confidence of success in his impetuous venture. He turned back to help Svengaard with the final details, wondering: *How do I know the agent's satisfied with my explanation?* No feeling of disquiet accompanied the question. *I know he's satisfied, but how do I know it?* Potter asked himself.

He realized then that his mind had been absorbing correlated gene information — the inner workings of the cells and their exterior manifestations — for so many years that this weight of data had fused into a new level of understanding. He was reading the tiny betrayals in gene-type reactions.

I can read people!

It was a staggering realization. He looked around the room at the nurses helping with the tie-off. When his eyes found the computer nurse, he *knew* she had deliberately destroyed the record tape. He knew it.

VII

Lizbeth and Harvey Durant walked hand in hand from the hospital after their interview with the Doctors Potter and Svengaard. They smiled and swung their clasped hands like children off on a picnic — which in a sense they were.

The morning's rain had been shut off and the clouds were being packed off to the east, toward the tall peaks that looked down on Seatac megalopolis. The overhead sky showed a clear cerulean blue with a goblin sun riding high in it.

A mob of people in loose marching order was coming through the park across the way, obviously the exercise period for

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some factory team or labor group. Their uniformed sameness was broken by flashes of color — an orange scarf on a woman's head, a yellow sash across a man's chest, the scarlet of a fertility fetish dangling on a gold loop from a woman's ear. One man had equipped himself with bright green shoes.

The pathetic attempts at individuality in a world of gene-stamped sameness stabbed through Lizbeth's defenses. She turned away lest the scene tear the smile from her lips, asked: "Where'll we go?"

"Hmmm?" Harvey held her back, waiting on the walk for the group to pass.

Among the marchers, faces turned to stare enviously at Harvey and Lizbeth. All knew why the Durants were here. The hospital, a great pile of plasmeld behind them, the fact that they were man and woman together, the casual dress, the smiles — all said the Durants were on breeder leave from their labors.

Each individual in that mob hoped with a lost desperation for this same escape from the routine that bound them all. Viable gametes, breeder leave — it was the universal dream. Even the known Sterries hoped, and so they patronized the breeder quacks and the manufacturers of doombah fetishes.

They have no pasts, Lizbeth thought, focusing abruptly on the common observation of the Folk philosophers. *They're all people without pasts and only the hope for a future to cling to. Somewhere our past was lost in an ocean of darkness. The Optimen and their gene surgeons have extinguished our past.*

Even their own breeder leave lost its special glow in the face of this. The Durants might not be constrained to leap up at the rising bell and hurry apart to their labors, but they were still people without a past. And their future might be lost in an instant. The child being formed in the hospital vat . . . in some small way it might still be part of them, but the surgeons had changed it. They had cut it off sharply from its past.

Lizbeth recalled her own parents, the feeling of estrangement from them, of differences which went deeper than blood.

They were only partly my parents, she thought. *They knew it. And I knew it.*

She felt the beginnings of estrangement from her own unformed son then, an emotion that colored present necessities. *What's the use?* she wondered. But she knew what the use was — to end forever all this amputation of pasts.

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The last envious face passed. The mob became moving backs, bits of color. They turned a corner and were gone, cut off.

Is it a corner we've turned and no coming back? Lizbeth wondered.

"Let's walk to the cross-town shuttle tube," Harvey said.

"Through the park?" she asked.

"Yes," Harvey said. "Just think — ten months."

"And we can take our son home," she said. "We're very lucky."

"It seems like a long time — ten months," Harvey said.

Lizbeth answered as they crossed the street and entered the park. "Yes, but we can come see him every week when they shift him to the big vat — and that's only three months away."

"You're right," Harvey said. "It'll be over before we know it. And thank the powers he's not a specialist or *anything else*. We can raise him at home. Our work time'll be reduced."

"That Doctor Potter's wonderful," she said.

As they talked, their clasped hands moved with the subtle pressures and finger shifts of the secret conversation — the *No-Spoken-Word* hand code that classified them as couriers of the Parents Underground.

"They're still watching **us,**" Harvey signaled.

"I know."

"Svengaard is out — a slave of the power structure."

"Obviously. You know, I had no idea the computer nurse was one of us."

"You saw that, too?"

"Potter was looking at her when she tripped the switch."

"Do you think the Security people saw her?"

"Not a chance. They were all concentrated on **us.**"

"Maybe she's not one of us," Harvey signaled. And he spoke aloud: "Isn't it a beautiful day. Let's take the floral path."

Lizbeth's finger pressures answered: "You think that nurse is an accidental?"

"Could be. Perhaps she saw what Potter'd accomplished and knew there was only one way to save the embryo."

"Someone will have to contact her immediately then."

"Cautiously. She might be unstable, emotional — a breeder neurotic."

"What about Potter?"

"We'll have to get people to him right away. We'll need his help getting the embryo out of there."

"That'll give us nine of Central's surgeons," she said.

"If he goes along," Harvey signaled.

She looked at him with a smile

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that completely masked her sudden worry. "You have doubts?"

"It's only that I think he was reading me at the same time I read him."

"Oh, he was," she said. "But he was slow and lame about it compared to us."

"That's how I read him. He was like a first reader, an amateur stumbling along, gaining confidence as he went."

"He's untrained," she said. "That's obvious. I was worried you'd read something in him that escaped me."

"I guess you're right."

Across the park, dust had shattered the sunlight into countless pillars that stood up through an arboretum. Lizbeth stared at the scene as she answered: "No doubt of it, darling. He's a *natural,* someone who's stumbled onto the talent accidentally. They do occur, you know — have to. Nothing can keep us from communicating."

"But *they* certainly try."

"Yes," she signaled. "They were very intent on it there today — probing and scanning us in that lounge. But people who think mechanically will never guess — I mean that our weapons are people and not things."

"It's their fatal blind spot," he agreed. "Central's carved out the genetic ruts with logic — and logic keeps digging the ruts deeper and deeper. They're so deep now they can't see over the edges to the outside."

"And that wide-wide universe out there calling to us," she signaled.

VIII

Max Allgood, Central's chief of Tachy-Security, climbed Administration's plasmeld steps slightly ahead of his two surgeon companions as befitted the director of the Optimen's swift and terrible hand of power.

The morning sun behind the trio sent their shadows darting across the white building's angles and planes.

They were admitted to the silver shadows of the entrance portico where a barrier dropped for the inevitable delay. Quarantine scanners searched and probed them for inimical microbes.

Allgood turned with the patience of long experience in this procedure, studied his companions — Boumour and Igan. It amused him that they must drop their titles here.

No doctors were admitted to these precincts. Here they must be pharmacists. The title doctor carried overtones which spread unrest among the Optimen. *They* knew about doctors, but only as ministers to the *mere* humans. A doctor became a euphemism in

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here, just as no one said *death* or *kill* or implied a machine or structure could wear out. Only new Optimen in their acolyte apprenticeship, or *meres* of young appearance served in Central, although some of the *meres* had been preserved by their masters for remarkable lengths of time.

Boumour and Igan both passed the test of youthfulness, although Boumour's face was of that pinched-up elfin type which tended to suggest age before its time. He was a big man with heavy shoulders, powerful. Igan looked lean and fragile beside him, a beaked face with long jaw and tight little mouth. The eyes of both men were Optiman color — blue and penetrating. They were probably near-Opts, both of them. Most Central surgeon-pharmacists were.

The pair moved restlessly under Allgood's gaze, avoiding his eyes. Boumour began talking in a low voice to Igan with one hand on the man's shoulder moving nervously, kneading. The movement of Boumour's hand on Igan's shoulder carried an odd familiarity, a suggestion to Allgood that he had seen something like this somewhere before. He couldn't place where.

The quarantine probing-scanning continued. It seemed to Allgood that it was lasting longer than usual. He turned his atten-

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tion to the scene across from the building. It was strangely peaceful, at odds with the mood of Central as Allgood knew it.

Allgood realized that his access to secret records and even to old books gave him an uncommon knowledge about Central. The Optiman demesne reached across leagues of what had once been the political entities of Canada and northern United States. It occupied a rough circle some seven hundred kilometers in diameter and with two hundred levels below ground. It was a region of multitudinous controls — weather control, gene control, bacterial control, enzyme control. Human control.

In this little corner, the heart of Administration, the ground had been shaped into an Italian chiaroscuro landscape — blacks and grays with touches of pastels. The Optimen were people who could barber a mountain at a whim: *A little off the top and leave the sideburns.* Throughout Central, nature had been smoothed over, robbed of her dangerous sharpness. Even when the Optimen staged some natural display, it lacked an element of drama which was a general lack in their lives.

Allgood often wondered at this. He had seen pre-Optiman films and recognized the differences. Central's manicured niceties seemed to him all tied up with the omnipresented triangles indicating pharmacy outlets where the Optimen might check their enzyme prescriptions.

"Are they taking a long time about it or is it just me?" Boumour asked. His voice carried a rumbling quality.

"Patience," Igan said. A mellow tenor there.

"Yes," Allgood said. "Patience is a man's best ally."

Boumour looked up at the Security chief, studying, wondering. Allgood seldom spoke except for effect. He, not the Optimen, was the conspiracy's greatest threat. He was body and soul with his masters, a super puppet. *Why did he order us to accompany him today?* Boumour wondered. *Does he know? Will he denounce us?*

There was a special ugliness about Allgood that fascinated Boumour. The Security chief was a stocky little Folk mere with moon face and darting almond eyes, a dark bush of hair low on his forehead — a Shang-cut by the look of his overt gene markers.

Allgood turned toward the quarantine barrier, and with a sudden feeling of awakening Boumour realized the man's ugliness came from within. It was the ugliness of fear, of created fear

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and personal fear. The realization gave Boumour an abrupt sensation of relief which he signaled to Igan through finger pressures on the man's shoulder.

Igan pulled away suddenly to stare out away from the building where they stood. *Of course Max Allgood fears,* he thought. *He lives in a mire of fears, named and nameless, just as the Optimen do. Poor creatures.*

The scene across from Central began to impress itself on Igan's senses. Here, at this moment, it was a day of absolute Spring, planned that way in the lordly heart of Weather Control. Administration's steps looked down on a lake, round and perfect like an enameled blue plate. On a low hill beyond the lake, plasmeld plinths stood out like white stones: elevator caps reaching down into the locked fastness of the Optiman quarters below — two hundred levels.

Far beyond the hill, the sky began to turn dark blue and oily. It was streaked suddenly with red, green and purple fires in a rather flat pattern. Presently, there came a low clap of contained thunder. Across the reaches of Central, some Upper Optiman was staging a tame storm for entertainment.

The storm was the first thing Allgood had seen this day to fit his interpretation of Central's inner rhythms. Things of an ominous nature set the pattern for his view of Central. People vanished into here never to be seen again and only he, Allgood, the chief of Tachy-Security, or a few trusted agents knew their fate. Allgood felt the thunderclap keyed to his mood, a sound that portended absolute power. Under the storm sky now turning acid yellow and dispersing the air of Spring, the plinths on the hill above the lake became pagan cenotaphs set out against a ground as purple-green as camomile.

"It's time," Boumour said.

Allgood turned to find the quarantine barrier lifted. He led the way into the Hall of Counsel with its shimmering adamantine walls above ranks of empty plasmeld benches. The trio moved through tongues of perfumed vapor that swayed aside as they breasted them.

Optiman acolytes wearing green capes fastened at the shoulders with diamond lanulas came from side shadows to pace them. Worked into the green of their robes were shepherd's pipes of platinum and they swung golden thuribles that wafted clouds of antiseptic pink smoke into the air.

Allgood kept his attention on the end of the hall. A giant globe

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as red as a mandrake stem hung in walking beams there. It was some forty meters in diameter, with a section folded back like a segment cut from an orange to reveal the interior. This was the Tuyere's control center, the tool of strange powers and senses with which *they* watched and ruled their minions. Lights flashed in there, phosphor greens and the blue cracklings of arcs. Great round gauges spelled out messages and red lights winked response. Numbers flowed on beams through the air and esoteric symbols danced on ribbons of light.

Up through the middle like the core of the fruit stretched a white column supporting a triangular platform at the globe's center. At the points of the triangle, each in a golden plasmeld throne, sat the Optiman trio known as the Tuyere — friends, companions, elected rulers for this century and with seventy-eight years yet to serve.

It was a wink of time in their lives. An annoyance. Often a disquieting one because they must face realities which all other Optimen could treat as euphemisms.

The acolytes stopped some twenty paces from the red globe, but continued swinging their thuribles. Allgood moved one pace ahead, motioned Boumour and Igan to halt behind him. The Security chief felt he knew just how far he could go here, that he must go to the limits. *They need me,* he told himself. But he held no illusions about the dangers in this interview.

Allgood looked up into the globe. A dancing lace of power placed a deceptive transparency over the interior. Through that curtain could be seen shapes, outlines — now clear, now enfolded.

"I came," Allgood said.

Boumour and Igan echoed the greeting, reminding themselves of all the protocol and forms which must be observed here. *Always use the name of the Optiman you address. If you do not know the name, ask it humbly.*

Allgood waited for the Tuyere to answer. Sometimes he felt they had no sense of time, at least of seconds and minutes and perhaps not even of days. It might be true. People of infinite lives might notice the passing seasons as clock ticks.

IX

The throne support turned, presenting the Tuyere one by one. They sat in clinging transluscent robes, almost nude, flaunting their similarity to the *meres.* Facing the open segment now was Nourse, a Greek god figure with blocky face, heavy brows, a chest ridged by muscles

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that rippled as he breathed. How evenly he breathed! With what controlled slowness!

The base turned, presented Schruille, the bone slender, unpredictable one with great round eyes, high cheeks and a flat nose above a mouth which seemed always pulled into a thin line of disapproval. Here was a dangerous one. Some said he spoke of things which other Optimen could not. In Allgood's presence, Schruille had once said "death," although referring to a butterfly.

Again, the base turned — and here was Calapine, her robe girdled with crystal plastrons. She was a thin, high-breasted woman with golden brown hair and chill, insolent eyes, full lips and a long nose above a pointed chin. Allgood had caught her watching him strangely on occasion. At such times he tried not to think about the Optimen who took *mere* playmates.

Nourse spoke to Calapine, looking at her through the prismatic reflector which each throne raised at a shoulder. She answered, but the voices did not carry to the floor of the hall.

Allgood watched the interplay for a clue to their mood. It was known among the Folk that Nourse and Calapine had been bedmates for periods that spanned hundreds of *mere* lifetimes. Nourse had a reputation of strength and predictability, but Calapine was known as a wild one. Mention her name and likely someone would look up and ask: "What's she done now?" It was always said with a touch of admiration and fear. Allgood knew that fear. He had worked for other ruling trios, but none who had his measure as did these three . . . especially Calapine.

The throne base stopped with Nourse facing the open segment. "You came," he rumbled. "Of course you came. The ox knows its owner and the ass its master's crib."

So it's going to be one of those days, Allgood thought. *Ridicule!* It could only mean they knew how we had stumbled . . . but didn't they always?

Calapine swiveled her throne to look down at the *meres*. The Hall of Counsel had been patterned on the Roman Senate with false columns around the edges, banks of benches beneath glittering scanner eyes. Everything focused down onto the figures standing apart from the acolytes.

Looking up, Igan reminded himself he had feared and hated these creatures all his life — even while he pitied them. How lucky he'd been to miss the Optiman cut. It'd been close, but he'd been saved. He could remember

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the hate of his childhood, before it had become tempered by pity. It'd been a clean thing then, sharp and real, blazing against the Givers of Time.

"We came as requested to report on the Durants," Allgood said.

He took two deep breaths to calm his nerves. These sessions were always dangerous, but doubly so since he'd decided on a double game. There was no turning back, though, and no wish to since he'd discovered the doppelgangers of himself they were growing. There could be only one reason they'd duplicate him. Well, they'd learn.

Calapine studied Allgood, wondering if it might be time to seek diversion with the ugly Folk male. Perhaps here was an answer to boredom. Both Schruille and Nourse indulged. She seemed to recall having done that before with another Max, but couldn't remember if it had helped her boredom.

"Say what it is we give you, little Max," she said.

Her woman's voice, soft and with laughter behind it, terrified him. Allgood swallowed. "You give life, Calapine."

"Say how many lovely years you have," she ordered.

Allgood found his throat contained no moisture. "Almost four hundred, Calapine," he rasped.

Nourse chuckled. "Ahead of you stretch many more lovely years if you serve us well," he said.

It was the closest to a direct threat Allgood had ever heard from an Optiman. They worked their wills by indirection, by euphamist subtlety. They worked through *meres* who could face such concepts as death and killing.

Who have they shaped to destroy me? Allgood wondered.

"Many little tick-tock years," Calapine said.

"Enough!" Schruille growled. He detested these interviews with the underclasses, the way Calapine baited the Folk. He swiveled his throne and now all the Tuyere faced the open segment. Schruille looked at his fingers, the ever youthful skin, and wondered why he had snapped that way. An enzymic imbalance? The thought touched him with disquiet. He generally held his silence during these sessions — as a defense because he tended to get sentimental about the pitiful *meres* and despise himself for it afterward.

Boumour moved up beside Allgood, said: "Does the Tuyere wish now the report on the Durants?"

Allgood stifled a feeling of

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rage at the interruption. Didn't the fool know that the Optimen must always appear to lead the interview?

"The words and images of your report have been seen, analyzed and put away," Nourse rumbled. "Now it is the non-report that we wish."

Non-report? Allgood asked himself. *Does he think we've hidden something?*

"Little Max," Calapine said. "Have you bowed to our necessity and questioned the computer nurse under narcosis?"

Here it comes, Allgood thought. He took a deep breath, said: "She has been questioned, Calapine."

Igan took his place beside Boumour, said: "There's something I wish to say about that if I . . ."

"Hold your tongue, pharmacist," Nourse said. "We talk to Max."

Igan bowed his head, thought: *How dangerous this is! And all because of that fool nurse. She wasn't even one of us. No cyborg-of-the-register knows her. A member of no cell or platoon. An accidental, a Sterrie, and she puts us in this terrible peril!*

Allgood saw that Igan's hands trembled, wondered: *What's driving these surgeons? They can't be such fools.*

"Was it not a deliberate thing the nurse did?" Calapine asked.

"Yes, Calapine," Allgood said.

"Your agents did not see it, yet we knew it had to be," Calapine said. She turned to scan the instruments of the control center, returned her attention to Allgood. "Say now why this was."

Allgood sighed. "I have no excuses, Calapine. The men have been censured."

"Say now why the nurse acted thus," Calapine ordered.

Allgood wet his lips with his tongue, glanced at Boumour and Igan. They looked at the floor. He looked back to Calapine, at her face shimmering within the globe. "We were unable to discover her motives, Calapine."

"Unable?" Nourse demanded.

"She . . . ahh . . . ceased to exist during the interrogation, Nourse," Allgood said. As the Tuyere stiffened, sitting bolt upright in their thrones, he added: "A flaw in her genetic cutting, so the pharmacists tell me."

"A profound pity," Nourse said, settling back.

Igan looked up, blurted: "It could've been a deliberate self-erasure, Nourse."

That damn fool! Allgood thought.

But Nourse stared now at Igan. "You were present, Igan?"

"Boumour and I administered the narcotics."

And she died, Igan thought. *But we did not kill her. She* died

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and we'll be blamed for it. Where could she have learned the *trick of stopping her own heart? Only Cyborgs are supposed to know and teach it.*

"Deliberate . . . self-erasure?" Nourse asked. Even when seen indirectly, the idea held terrifying implications.

"Max!" Calapine said. "Say now if you used excessive . . . cruelty." She leaned forward, wondering why she wanted him to admit barbarity.

"She suffered nothing, Calapine," Allgood said.

Calapine sat back disappointed. *Could he be lying?* She read her instruments: Calmness. He wasn't lying.

"Pharmacist," Nourse said. "Explain your opinion."

"We examined her carefully," Igan said. "It couldn't have been the narcotics. There's no way. . ."

"Some of us think it was a genetic flaw," Boumour said.

"There's disagreement," Igan said. He glanced at Allgood, feeling the man's disapproval. It had to be done, though. The Optimen must be made to know disquiet. When they could be tricked into acting emotionally, they made mistakes. The plan called for them to make mistakes now. They must be put off balance — subtly, delicately.

"Your opinion, Max?" Nourse asked. He watched carefully. They'd been getting poorer models lately, doppelganger degeneration.

"We've already taken cellular matter, Nourse," Allgood said, "and are growing a duplicate. If we get a true copy, we'll check the question of genetic flaw."

"It is a pity the doppelganger won't have the original's memories," Nourse said.

"Pity of pities," Calapine said. She looked at Schruille. "Is this not true, Schruille?"

Schruille looked up at her without answering. Did she think she could bait him the way she did the meres?

"This woman had a mate?" Nourse asked.

"Yes, Nourse," Allgood said.

"Fertile union?"

"No, Nourse," Allgood said. "A Sterrie."

"Compensate the mate," Nourse said. "Another woman, a bit of leisure. Let him think she was loyal to us."

Allgood nodded, said: "We are giving him a woman, Nourse, who will keep him under constant surveillance."

A trill of laughter escaped Calapine. "Why has no one mentioned this Potter, the genetic engineer?" she asked.

"I was coming to him, Calapine," Allgood said.

"Has anyone examined the em-

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bryo?" Schruille asked, looking up suddenly.

"No, Schruille," Allgood said.

"Why not?"

"If this is a concerted action to escape genetic controls, Schruille, we don't want members of the organization to know we suspect them. Not yet. First, we must learn all about these people — the Durants, their friends, Potter . . . everyone."

"But the embryo's the key to the entire thing," Schruille said. "What was done to it? What is it?"

"It is bait, Schruille," Allgood said.

"Bait?"

"Yes, Schruille, to catch whoever else may be involved."

"But what was done to it?"

"How can that matter, Schruille, as long as we can . . . as long as we have complete control over it."

"The embryo is being guarded most adroitly, I hope," Nourse said.

"Most adroitly, Nourse."

"Send the pharmacist Svengaard to us," Calapine ordered.

"Svengaard . . . Calapine?" Allgood asked.

"You need not know why," she said. "Merely send him."

"Yes, Calapine."

She stood up to signify the end of the interview. The acolytes turned around, still swinging their thuribles, prepared now to escort the meres from the hall. But Calapine was not finished. She stared at Allgood, said: "Look at me, Max."

He looked, recognizing that strange, studying set to her eyes.

"Am I not beautiful?" she asked.

Allgood stared at her, the slender figure with its outlines softened by the robe and curtains of power within the globe. She was beautiful as were many Optiman females. But the beauty repelled him with its threatening perfection. She would live indefinitely, already had lived forty or fifty thousand years. But one day his lesser flesh would reject the medical replacements and the enzyme prescriptions. He would die while she went on.

His lesser flesh rejected her.

"You are beautiful, Calapine," he said.

"Your eyes never admit it," she said.

"What do you, Cal?" Nourse asked. "Do you want this . . . do you want Max?"

"I want his eyes," she said. "Just his eyes."

Nourse looked at Allgood, said: "Women." His voice held a note of false cameradderie.

Allgood stood astonished. He had never heard that tone from an Optiman before.

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"I make a point," Calapine said. "Don't interrupt my words with male jokes. In your heart of hearts. Max, how do you feel about me?"

"Ahhhh," Nourse said. He nodded.

"I shall say it for you," she said as Allgood remained mute. "You worship me. Never forget that, Max. You worship me." She looked at Boumour and Igan, dismissed them with a wave of her hand.

Max Allgood lowered his eyes, feeling the truth in her words. He turned, and with the ecolytes flanking them, proceeded to lead Igan and Boumour out of the hall.

As they emerged onto the steps, the acolytes held back and the barrier dropped. Igan and Boumour turned left, noting a new building at the end of the long esplanade which fronted Administration. They saw its machicolated walls, the openings fitted with colored filters which sent bursts of red, blue and green light upon the surrounding air, and they recognized that it blocked the way they had intended to take out of Central. A building suddenly erected, another Optiman toy. They saw it and planned their steps accordingly with the automatic acceptance that marked them as regulars in the Optiman demesne. The meres and inhabitants of Central seemed to know their way through the arabesques of its roads and streets by an instinct. The place defied cartographers because the Optimen were too subject to change and whim.

"Igan!"

It was Allgood calling from behind them.

They turned,stood still, waiting for him to catch up with them.

Allgood planted himself in front of them, hands on hips, said: "Tell me, do you worship her, too?"

"Don't speak foolishness," Boumour said.

"No," Allgood said. His eyes appeared to be sunk in pockets above the high cheekbones. "I belong to no Folk cult, no breeder congregation. How can I worship her?"

"But you do," Igan said.

"Yes!"

"They are the real religion of our world," Igan said. "You do not have to belong to a cult or carry a talisman to know this. Calapine merely told you that, if there is a conspiracy, those belonging to it are heretics."

"Is that what she meant?"

"Of course."

"And she must know what is done to heretics," Allgood said.

"Without a doubt," Boumer said.

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X

Svengaard had seen this building in the tri-casts and entertainment vids. He'd heard descriptions of the Hall of Counsel—but actually to be standing here at the quarantine wall with the copper sheen of sunset over the hills across from it . . . he'd never dreamed this could occur.

Elevator caps stood out like plasmeld warts on the hillcock in front of him. There were other low hills beyond with piled buildings on them that could have been mistaken for rock outcroppings.

A lone woman passed him on the esplanade, pulling a ground-effect cart filled with oddly shaped bundles. Svengaard found himself worried about what the bundles might contain, but he knew he dared not ask or show undue curiosity.

The red triangle of a pharmacy outlet glowed on a pillar beside him. He passed it, glanced back at his escort.

He had come halfway across the continent in the tube with an entire car to himself except for the escort, an agent from T-Security. Deep into Central they'd come, the gray-suited T-Security agent always beside him.

Svengaard began climbing the steps.

Already Central was beginning to weigh on him. There was a sense of something disastrous about the place. Even though he suspected the source of the feeling, he couldn't shake it off. It was all the Folk nonsense you could never quite evade, he'd decided. The Folk were a people for the most part without legends or ancient myths except where such matters touched the Optimen. In the Folk memories, Central and the Optimen were fixed with sinister omens compounded of awesome fear and adulation.

Why did they summon me? Svengaard asked himself. The escort refused to say.

They were stopped by the wall and waited now, silent, nervous.

Even the agent was nervous, Svengaard saw.

Why did they summon me?

The agent cleared his throad: "Have all the protocol straight?"

"I think so," Svengaard said.

"Once you get into the hall, keep pace with the acolytes who'll escort you from there. You'll be interviewed by the Tuyere — Nourse, Shruille and Calapine. Remember to use their names when you address them individually. Use no such words as death or kill or die. Avoid the very concepts if you can. Let them lead the interview. Best not to volunteer anything."

Svengaard took a trembling breath.

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Have they brought me here to advance me? he wondered. *That must be it. I've served my apprenticeship under such men as Potter and Igan. I'm being promoted to Central.*

"And don't say doctor," the escort said. "Doctors are pharmacists or genetic engineers."

"I understand," Svengaard said.

"Allgood wants a complete report on the interview afterward," the agent said.

"Yes, of course," Svengaard said.

The quarantine barrier lifted.

"In you go," the agent said.

"You're not coming with me?" Svengaard asked.

"Not invited," the agent said. He turned, went down the steps.

Svengaard swallowed, entered the silver gloom of the portico, stepped through to find himself in the long hall with an escort of six acolytes, three to a side, swinging thuribles from which pink smoke wafted. He smelled the antiseptics in the smoke.

The big red globe at the end of the hall dominated the place. Its open segment showing flashing and winking lights, with moving shapes inside, fascinated Svengaard.

The acolytes stopped him twenty paces from the opening and he looked up at the Tuyere, recognizing them through the power curtains—Nourse in the center flanked by Calapine at left and Schruille.

"I came," Svengaard said, mouthing the greeting the agent had told him to use. He rubbed sweaty palms against his best tunic.

Nourse spoke with a rumbling voice: "You are the genetic engineer, Svengaard."

"Thei Svengaard, yes . . . Nourse." He took a deep breath, wondering if they'd caught the hesitation while he remembered to use the Optiman's name.

Nourse smiled.

"You assisted recently in the genetic alteration of an embryo from a couple named Durant," Nourse said. "The chief engineer at the cutting was Potter."

"Yes, I was the assistant, Nourse."

"There was an accident during this operation," Calapine said.

There was a strange musical quality in her voice, and Svengaard recognized she hadn't asked a question, but had reminded him of a detail to which she wanted him to give his attention. He felt the beginnings of a profound disquiet.

"An accident, yes . . . Calapine," he said.

"You followed the operation closely?" Nourse asked.

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"Yes, Nourse." And Svengaard found his attention swinging to Schruille, who sat there brooding and silent.

"Now then," Calapine said, "you will be able to tell us what it is Potter has concealed about this genetic alteration."

Svengaard found that he had lost his voice. He could only shake his head.

"He concealed nothing?" Nourse asked. "Is that what you say?"

Svengaard nodded.

"We mean you no harm, Thei Svengaard," Calapine said. "You may speak."

Svengaard swallowed, cleared his throat. "I . . ." he said. ". . . the question . . . I saw nothing . . . concealed." He fell silent, then remebered he was supposed to use her name and said: "Calapine," just as Nourse started to speak. Nourse broke off, scowled.

Calapine giggled.

Nourse said: "Yet you tell us you followed the genetic alteration."

"I . . . wasn't on the microscope with him every second," Svengaard said. "Nourse. I . . . uh . . . the duties of the assistant —instructions to the computer nurse, keying the feeder tapes and so on."

"Say now if the computer nurse was a special friend of yours," Calapine ordered.

"I . . . she'd . . ." Svengaard wet his lips with his tongue. *What do they want?* "We'd worked together for a number of years, Calapine. I can't say she was a friend. We worked together."

"Did you examine the embryo after the operation?" Nourse asked.

Schruille sat up, stared at Svengaard.

"No, Nourse," Svengaard said. "My duties were to secure the vat, check life-support systems." He took a deep breath. Perhaps they were only testing him after all. But such odd questions!

"Say now if Potter is a special friend," Calapine ordered.

"He was one of my teachers, Calapine someone I've worked with on delicate genetic problems."

"But not in your particular circle," Nourse said.

Svengaard shook his head. Again he sensed menace.

He didn't know what to expect. Perhaps the great globe would roll over, crush him, reduce his body to scattered atoms. But no — the Optimen couldn't do that. He studied the three faces as they becam eclear through the power curtains, seeking a sign. Clean, sterile faces. He could see the genetic markers in their features—they might be any Sterries of the Folk except for the

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Optiman aura of mystery. Folk rumor said they were sterile by choice, that they saw breeding as the beginning of death; but the genetic clues of their features spoke otherwise to Svengaard.

"Why did you call Potter on this particular problem?" Nourse asked.

Svengaard took a tight, quavering breath, said: "He . . . the embryo's genetic configuration . . . near-Opt. Potter is familiar with our hospital. He . . . I have confidence in him; brilliant sur . . . genetic engineer."

"Say now if you are friendly with any other of our pharmacists," Calapine said.

"I work with them when they come to our facility," Svengaard said.

"Calapine," Nourse supplied.

A trill of laughter shook her.

A dark flush spread up from Svengaard's collar. He began to feel angry. What kind of test was this? Couldn't they do anything but sit there, mocking, questioning?

Anger gave Svengaard command of his voice and he said: "I'm only head of genetic engineering at one facility, Nourse — a lowly district engineer. I handle routine cuttings. When something requires a specialist, I follow orders and call a specialist. Potter was the indicated specialist for this case."

"*One* of the specialists," Nourse said.

"One I know and respect," Svengaard said. This time he didn't bother adding the Optiman's name.

"Say now if you are angry," Calapine ordered, and there was that musical quality in her voice.

"I'm angry."

"Say why."

"Why am I here?" Svengaard asked. "What kind of interrogation is this? Have I done something wrong? Am I to be censured?"

Nourse bent forward and placed his hands on his knees. "You dare question us?"

Svengaard stared at the Optiman. In spite of the tone of the question, the square, heavy-boned face appeared reassuring, calming. "I'll do anything I can to help you," Svengaard said. "Anything. But how can I help or answer you when I don't know what you want?"

Calapine started to speak, but stopped when Nourse raised his hand.

"Our most profound wish that we could tell you," Nourse said. "But surely you know we can have no true discourse. How could you understand what we understand? Can a wooden bowl contain sulphuric acid- You must trust us. We seek what is best for you."

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XI

A sense of warmth and gratitude permeated Svengaard. Of course he trusted them. They were the genetic apex of humankind. And he reminded himself: *They are the power that loves us and cares for us.*

Svengaard sighed. "What do you wish of me?"

"You have answered all our questions," Nourse said. "Even our non-questions are answered."

"Now, you will forget everything that has happened here between us," Calapine said. "You will repeat our conversation to no person."

Svengaard cleared his throat. "To no one . . . Calapine?"

"No one."

"Max Allgood has asked that I report to him on—"

"Max must be denied," she said. "Fear not, Thei Svengaard. We will protect you."

"As you command," Svengaard said. "Calapine."

"It is not our wish that you think us ungrateful of your loyalty and services," Nourse said. "We are mindful of your good opinion and would not appear cold nor callous in your eyes. Know that our concern is for the larger good of humankind."

"Yes, Nourse," Svengaard said.

It was a gratituitous speech, its tone disturbing to Svengaard, but it helped clear his reason. He began to see the direction of their curiosity, to sense their suspicions. Those were his suspicions now. Potter had betrayed his trust, had he? The business with the accidentally destroyed tape had not been an accident. Very well—the criminals would pay!

"You may go now," Nourse said.

"With our blessing," Calapine said.

Svengaard bowled. And he marked that Schruille had not spoken or moved during the entire interview. Svengaard wondered why this fact, of itself, should be a suddenly terrifying thing. His knees trembled as he turned, the acolytes flanking him with their smoking thuribles, and left the hall.

They watched until the barrier dropped behind Svengaard.

"Another one who doesn't know what Potter achieved," Calapine said.

"Are you sure Max doesn't know?" Schruille asked.

"I'm sure," she said.

"Then we should've told him."

"And told him how we knew?" she asked.

"I know the argument," Schruille said. "Blunt the instrument, spoil the work."

"That Svengaard, he's one of the reliable ones," Nourse said.

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"It is said we walk the sharp edge of a knife," Schruille said. "When you walk the knife, you must be careful how you place your feet."

"What a disgusting idea," Calapine said. She turned to Nourse. "Are you still hobbying daVinci, dearest?"

"His brush stroke," Nourse said. "A most exacting discipline. I should have it in forty or fifty years. Soon at any rate."

"Provided you've placed each step correctly," Schruille said.

Presently, Nourse said: "Sometimes, Schruille, you allow cynicism to carry you beyond the bounds of propriety." He turned, studied the instrument gauges, sensors, peek-eyes and read-outs across from Calapine on the inner wall of the globe. "It's reasonably quiet today. Shall we leave the control with Schruille, Cal, and go down for a swim and a pharmacy session?"

"Body tone, body tone," Schruille complained. "Have you ever considered doing twenty-five laps of the pool instead of twenty?"

"You say the most astonishing things of late," Calapine said. "Would you have Nourse upset his enzyme balance? I fail completely to understand you."

"Fail to try," Schruille said.

"Is there anything we can do for you?" she asked.

"My cycle has plunged me into dreadful monotony," Schruille said. "Is there something you can do about that?"

Nourse looked at Schruille in the prismatic reflector. The man's voice with its suggestion of a whine had grown increasingly annoying of late. Nourse was beginning to regret that community of tastes and bodily requirements had thrown them together. Perhaps when the Tuyere's service was done . . .

"Monotony," Calapine said. She shrugged.

"There's a certain triumph in well-considered monotony," Nourse said. "That's Voltaire, I believe."

"It sounded like the purest Nourse," Schruille said.

"I sometimes find it helpful," Calapine said, "to invoke a benign concern for the Folk."

"Even among ourselves?" Schruille asked.

"Consider the fate of the poor computer nurse," she said "In the abstract, naturally. Can you not feel sorrow and pity?"

"Pity's a wasteful emotion," Schruille said. "Sorrow is akin to cynicism." He smiled. "This will pass. Go to your swim. When the vigor's on you, think of me . . . here."

Nourse and Calapine stood, ordered the carrier beams into position.

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"Efficiency," Nourse said. "We must seek more efficiency in our minions. Things must be made to run more smoothly."

Schruille looked up at them waiting for the beams. He wanted only to be free of the wanton rambling of their voices. They missed the point, insisted on missing it.

"Efficiency?" Calapine asked. "Perhaps you're right."

Schruille no longer could contain the emotions at war within him. "Efficiency's the opposite of craftsmanship," he said. "Think on that!"

The place was a pumping sta- Calapine slid down and away without answering, leaving Schruille to close the segment.

He sat alone at last within the green-blue-red winking of the control center—alone except for the glittering eyes of scanners activated along the upper circle of the globe. He counted eighty-one of them alive and staring at him and at the responses of the globe. Eighty-one of his fellows—or groups of his fellows—were out there observing him and his work as he observed the Folk and their work.

The scanners imparted a vague uneasiness to Schruille. Before the Tuyere's service, he could never remember watching the control center or its activities. Too much that was painful and unthinkable occurred here. Were they former masters of the control center, curious about how the new trio dispatched its duties? Who *were* the watchers?

Schruille dropped his attention to the instruments. In moments like this he often felt like Chen Tzu-ang's "Master of Dark Truth" who saw the whole world in a jade bottle. Here was the jade bottle—this globe. A flick of the power ring on the arm of his throne and he could watch a couple making love in Warsopolis, study the contents of an embryo vat in Greater London or loose hypnotic gas with taming suggestions into a warren of New Peking. The touch of a key and he could analyze the shifting motives of an entire work force in the megalopolis of Roma.

Searching within himself, Schruille could not find the impulse to move a single control.

He thought back, trying to remember how many scanners had watched the first years of the Tuyere's service. He was sure it had never exceeded ten or twelve. But now—eighty-one.

I should've warned them about Svengaard, he thought. *I could've said that we shouldn't rely on the assumption there's a special Providence for fools. Svengaard is a fool who disturbs me.*

But Nourse and Calapine

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would've defended Svengaard. He knew it. They'd have insisted the man was reliable, honorable, loyal. They'd wager anything on it.

Anything? Schruille wondered. *Is there something they might not wager on Svengaard's loyalty?*

Schruille could almost hear Nourse pontificating: *Our judgment of Svengaard is the correct one.*

And that, Schruille thought, *is what disturbs me. Svengaard worships us . . . as does Max. But worship is nine-tenths fear.*

In time, everything becomes fear.

Schruille looked up at the watching scanners, spoke aloud: "Time-time-time . . ."

Let that chew at their vitals, he thought.

XII

The place was a pumping station for the salvage reclamation system of Seatac megalopolis. It lay at the eleven hundred foot level on the spur line that sent byproduct irrigation water into Grand Coulee system. A four-story box of sampling pipes, computer consoles and access catwalks aglow with force-buoyed lights, it throbbed to the pulse of the giant turbines it controlled.

The Durants had come down through the personnel tubes during the evening rush hour, moving in easy random stages that insured they weren't followed and that they carried no tracer devices. Five inspection tubes had passed them as clean.

Still, they were careful to read the faces and actions of the people who jostled past. Most of the people were dull pages, hurried, intent on their own business. Occasionally, they exchanged a mutual reading-glance with another courier, or identified subofficials with the fear goading them on Optiman errands.

No one noticed a couple in workman brown, their hands clasped, who emerged onto Catwalk Nine of the pumping station.

The Durants paused there to survey their surroundings. They were tired, elated and more than a little awed at having been summoned into the control core of the Parents Underground. The smell of hydrocarbons filled the air around them. Lizbeth sniffed.

Her silent conversation through their clasped hands carried overtones of tension. Harvey worked to reassure her.

"It's probably our Glisson we're to see," he said.

"There could be other Cyborgs with the same name," she said.

"Not likely."

He urged her out onto the catwalk, past a hover light. They

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took a left branching past two workmen reading pitot gauges, their faces in odd shadows created by the lights from below.

Lizbeth felt the lonely exposure of their position, signaled: "How can we be sure *they* aren't watching us here?"

"This must be one of our places," he said. "You know."

"How can it be?"

"Route the scanners through editing computers," he said. "The Opts see only what we want them to see then."

"It's dangerous to feel sure of such things," she said. Then: "Why have they summoned us?"

"We'll know in a few minutes," he said.

The walk led through a dust-excluding lock port into a tool bunker, gray walls punctured by outlets for transmission tubes, the inevitable computer controls blinking, ticking, chuckling, whirring. The place smelled of a sweet oil.

As the port clanged shut behind the Durants, a figure came from their left and sat on a padded bench across from them.

The Durants stared silently, recognizing and repelled by the recognition. The figure's outline suggested neither man nor woman. It looked planted there in the seat, and as they watched, it pulled thin cables from pockets in its gray coveralls, plugged the cables into the computer wall.

Harvey brought his attention up to the square, deeply seamed face and the light gray eyes with their stare of blank directness, that coldly measured observation which was a trademark of the Cyborg.

"Glisson," Harvey said. "You summoned us?"

"I summoned you," the Cyborg said. "It has been many years, Durant. Do you still fear us? I see that you do. You are late."

"We're unfamiliar with this area," Harvey said.

"We came carefully," Lizbeth said.

"Then I taught you well," Glisson said. "You are reasonably good pupils."

Through their clasped hands, Lizbeth signaled: "They're so hard to read, but something's wrong." She averted her eyes from the Cyborg, chilled by the weighted stare. No matter how she tried to think of them as flesh and blood, her mind could never evade the knowledge that such bodies contained miniaturized computers linked directly to the brain, that the arms were not arms but prosthetic tools and weapons. And the voice—such a clipped-off unemotional quality.

"You should not fear us, Madame," Glisson said. "Unless you are not Lizbeth Durant."

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Harvey failed to repress the snap of anger, said: "Don't talk to her that way! You don't own us."

"What is the first lesson I taught you after you were recruited?" Glisson asked.

Harvey brought himself under control, forced a rueful smile onto his mouth. "To hold our tempers," he said. Lizbeth's hand continued to tremble in his.

"That lesson you did not learn well," Glisson said. "I overlook your fallibility."

Through their hands, Lizbeth signaled: "It was prepared for violence against us."

Harvey acknowledged.

"First," Glisson said, "you will report on the genetic operation." There was a pause while the Cyborg changed its jacked connections to the computer wall. "Do not be distracted by my work. I distribute tools—thus." It indicated the bunker. "this space, which appears on *their* screens as a chamber filled with tools, will never be investigated."

A bench slid from the wall to the Durants' right. "If you are fatigued, sit," Glisson said. The Cyborg indicated its cable linkage to the wall computer. "I sit only that I may carry on the work of this space while we speak." The Cyborg smiled, a stiff rictus to signify that the Durants must realize such as Glisson did not feel fatigue.

Harvey urged Lizbeth to the bench. They sat as he signaled: Caution. Glisson's maneuvering us. Something's being hidden."

Glisson turned slightly to face them, said: "A verbal, factual, complete report. Leave out nothing, no matter how trivial it may seem to you. I have limitless capacity for data."

They began recounting what they had observed of the genetic operation, taking up from each other on cue without a break as good couriers were taught to do. Harvey experienced the odd feeling during the recital that he and Lizbeth became part of the Cyborg's mechanism. Questions came so mechanically from Glisson's lips. Their answers felt so clinical. He had to keep reminding himself: *This is our son we discuss.*

Presently, Glisson said: "There seems no doubt we've another self-viable. Your evidence virtually completes the picture. We have other data, you know."

"I didn't know the surgeon was one of us," Lizbeth said.

There was a pause while Glisson's eyes went even blanker than usual. The Durants felt they could almost see the esoteric formulae flitting through Glisson's thinking-banks. It was said the Cyborgs composed most of their

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thoughts only in higher math, translating to common language as it suited them.

"The surgeon was not one of us," Glisson said. "But he soon will be."

What strategic formula produced those words? Harvey wondered. "What about the computer tape on the operation?" he asked.

"It's destroyed," Glisson said. "Even now, your embryo is being removed to a safe place. You will join him soon." A mechanical chuckle escaped the Cyborg's lips.

Lizbeth shivered. Harvey felt the tension of her through their hands. He said: "Is our son safe?"

"Safe," Glisson said. "Our plans insure that safety."

"How?" Lizbeth asked.

"You will understand soon," Glisson said. "An ancient and reliable way of safe concealment. Be assured: self-viables are valuable weapons. We do not risk our valuable weapons."

Lizbeth signaled: "The cut—ask now."

Harvey wet his lips with his tongue, said: "There are . . . when a Central surgeon's called in, usually it means the embryo could be cut to Optiman. Did they . . . is our son . . ."

Glisson's nostrils flared. The face took on a look of hauteur that said such ignorance insulted a Cyborg. The clipped voice said: "We would require a complete tape record, including the enzymic data even to guess. The tape is gone. Only the surgeon knows the result of the operation for certain. We have yet to question him."

Lizbeth said: "Svengaard or the computer nurse might've said something that . . ."

"Svengaard is a dolt," Glisson said. "The computer nurse is dead."

"They killed her?" Lizbeth whispered.

"How she died isn't important," Glisson said. "She served her purpose."

With his hand, Harvey signaled: "The Cyborgs certainly had something to do with her death."

"I saw," she answered.

Harvey said: "Are you . . . will we be allowed to talk to Potter?"

"Potter will be offered full Cyborg status," Glisson said. "Talking will be his decision . . . afterward."

"We want to know about our son!" Lizbeth flared.

Harvey signaled frantically: "Apologize!"

"Madame," Glisson said, "let me remind you the so-called Optiman cut is not a state to which we aspire. Remember your vows."

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She squeezed Harvey's hand to silence his signals, said: "I'm sorry. It was such a shock to learn . . . the possibility . . ."

"Your emotional excesses are taken into account as a mitigating circumstance," Glisson said. "It is well, therefore, that I warn you of a thing to happen. You will hear things about your son which you must *not* let excite you."

"What things?" Lizbeth whispered.

"An outside force of unknown origin sometimes interferes with the anticipated course of a genetic operation," Glisson said. "There is reason to believe this happened with your son."

"What do you mean?" Harvey asked.

"Mean!" Glisson sneered. "You ask questions to which there are no answers."

"What does this . . . *thing* do?" Lizbeth supplied.

Glisson looked at her. "It behaves somewhat in the fashion of a charged particle, penetrates the genetic core and alters the structure. If this has happened to your son, you may consider it beneficial because it apparently prevents the Optiman cut."

The Durants digested this.

Presently Harvey said: "Do you require more of us? May we go now?"

"You will remain here."

They stared.

"You will wait for further orders," Glisson said.

"But we'll be missed," Lizbeth said. "Our apartment, they'll—"

"We've raised doppelgangers to play your roles long enough for you to escape Seatac," Glisson said. "You can never go back. You should've known this."

Harvey's lips moved, then: "Escape? What's . . . why are . . ."

"There is violence," Glisson said. "Even now. The death-wish cults will have their day." The Cyborg raised its gaze toward the ceiling. "War . . . blood . . . killing. It will be as it was before when the skies flamed and the earth ran molten."

Harvey cleared his throat. *Wars . . . before.* Glisson gave the impression that wars had been recent, perhaps only yesterday. And for this Cyborg that might be true. It was said that Glisson's grandsir had fought in the Optiman-Cyborg war. No one of the Underground Folk knew how many identities Glisson had lived.

"Where'll we go?" Harvey asked. He signaled Lizbeth not to interrupt.

"A place has been prepared."

The Cyborg arose, unplugged its linkage with the computer panel, said: "You will wait here. Do not attempt to leave. Your needs will be provided for."

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Glisson left by the lock port and it sealed with a heavy thump.

XIII

"They're as bad as the Optimen," Lizbeth signaled.

"The day will come when we're free of both them and the Opts," Harvey said.

"It'll never happen," she said.

"Don't say that!" he ordered.

"If only we knew a friendly surgeon," she said. We could take our son and run."

"That's foolishness! How could we service the vat without machinery for . . ."

"I've that machinery right inside me," she said. "I was . . . born with it."

Harvey stared at her, shocked speechless.

"I don't want the Cyborgs or the Opts controlling our son's life," she said, "regulating his mind with hypnotic gas, making duplicates of him for their own purposes, pushing him and leading him and . . ."

"Don't work yourself into a state," he said.

"You heard him," she said. "Doppelgangers! They can regulate anything—our very being! They can condition us to . . . to . . . do anything! For all we know, we've been conditioned to be here right now!"

"You're being unreasonable."

"Unreasonable? Look at me! They can take a piece of my skin and grow an identical copy. Me! Identical! How do you know I'm me? How do you know I'm the original me? How do I know?"

He gripped her free arm and for a moment had no words. Presently, he forced himself to relax, shook his head. "You're you, Liz. You're not flesh grown from a cell. You're . . . all the things we've shared . . . and been . . . and done together They couldn't duplicate memories . . . not *that* with a doppelganger."

She pressed her cheek against the rough fabric of his jacket, wanting the comfort of it, the tactile sensation that told her body he was here and he was real.

"They'll make doppelgangers of our son," she said. "That's what they're planning."

"Then we'll have many sons."

"For what reason?" She looked up at him, her lashes damp with unshed tears. "You heard what Glisson said. Something from *outside* adjusted our embryo. What was it?"

"Somebody must know."

"I know you," he said. "You want to think it's God."

"What else could it be?"

"Anything—chance, accident, some higher order manipulator. Maybe someone's discovered something they're not sharing."

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"One of us? They wouldn't!"

"Nature, then," he said. "Nature asserting itself in the interest of Man."

"Sometimes you sound like a cultist!"

"It isn't the Cyborgs," he said. "We know that."

"Glisson said it was beneficent."

"But it's genetic shaping. That's blasphemy to them. Physical alteration of the bioframe, that's their way."

"Like Glisson," she said. "That robot with flesh." Again, she pressed her cheek against him. "That's what I fear— they'll do that to our son . . . our sons."

"The courier service outnumbers the Cyborgs a hundred to one," he said. "As long as we stick together, we'll win."

"But we're just flesh," she said, "and so weak."

"And we can do something all those Sterries together can't do," he reminded her. "We can perpetuate our own kind."

"What does it matter?" she asked. "Optimen never die."

Svengaard waited for night and checked the area through the observation screens in his office before going down to the vat room. In spite of the fact that this was *his* hospital and he had a perfect right here, he was conscious of doing a forbidden thing. The significance of the interview at Central hadn't escaped him. The Optimen wouldn't like this. But he had to look in that vat.

He paused in the darkness of the vat room, stood there near the door, realizing with a sense of detachment that he had never before been in here without the full blaze of lights. There were only the glow bulbs behind gauges and telltales now—faint dots and circles of luminescence by which to orient himself.

The *thrap-thrap-thrap* of viapumps created an odd contrapuntal rhythm which filled the gloom with a sense of urgency. Svengaard imagined all the embryos in there (twenty-one at the morning count) their cells reaching out, doubling and redoubling in the strange ecstasy of growth — becoming unique, distinct, discrete individuals.

Not for them the contraceptive gas that permeated Folk breathing spaces. Not yet. Now, they could grow almost as their ancestors had grown before the genetic engineers.

Svengaard sniffed.

His nostrils, instinctively alerted by the darkness, sensed the amniotic saltiness of the air. From its odor, this room could almost have been a primal seashore with life burgeoning in its ooze.

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Svengaard shuddered and reminded himself: *I'm a submolecular engineer, a gene surgeon. There's nothing strange here.*

But the thought failed to convince him.

He pushed himself away from the door, headed down the line looking for the vat with the Durant embryo. In his mind lay the clear memory of what he had seen in that embryo — the intrusion that had flooded the cells with arginine. Intrusion. Where had it originated? Was Potter correct? Was it an unknown creator of stability? Stability . . . order . . . systems. Extended systems . . . infinite aspects of energy that left all matter insubstantial.

These suddenly were frightening thoughts here in the whispering gloom.

He stumbled against a low instrument stand, cursed softly. His stomach felt tight with the urgency of the viapumps and the real urgency in the fact that he had to finish here before the duty nurse made her hourly rounds.

An insect shape, shadow against shadows, stood out against the wall in front of him. He froze and it took a moment for him to recognize the familiar outlines of the meson microscope.

Svengaard turned to the luminous numbers on the vats — twelve, thirteen, fourteen . . . fifteen. Here it was. He checked the name on the tag, reading it in the glow of a gauge bulb: "Durant."

Something about this embryo had the Optimen upset and Security in an uproar. His regular computer nurse was gone — where, nobody could say. The replacement walked like a man.

Svengaard wheeled out the microscope, moving gently in the darkness, positioned the instrument over the vat, made the connections by feel. The vat throbbed against his fingers. He rigged for scanning, bent to the viewer.

Up out of the swarming cellular mass came a hydrophilic gene segment. He centered on it, the darkness forgotten as he pushed his awareness into the scope-lighted field of the viewer. Meson probes slid down . . . down into the mitochondrial structure. He found the alpha-helices and began checking out polypeptide chains.

A puzzled frown creased his brow. He switched to another cell. Another.

The cells were low in arginine — he could see that. Thoughts brushed their way through his mind as he peered and hunted: *How could the Durant embryo, of all embryos, be low on arginine? Any normal male would have more sperm protamine than*

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this. How could the ADP-ATP exchange system carry no hint of Optiman? The cut wouldn't make this much difference.

Abruptly, Svengaard sent his probes down into the sex identifiers, scanned the overlapping helices.

Female!

He straightened, checked number and tag. "Fifteen. Durant."

Svengaard bent to the inspection chart, read it in the gauge glow. It showed the duty nurse's notations for the eighty-first hour. He glanced at his watch: still twenty minutes before she made the eighty-second hour check.

The Durant embryo could not possibly be female, he thought. *Not from Potter's operation.*

Someone had switched embryos, he realized. One embryo would activate the vat's life-system responses much like another. Without microscopic examination, the change couldn't be detected.

Who?

In Svengaard's mind, the most likely candidates were the Optimen. They'd removed the Durant embryo to a safe place and left a substitute.

Why?

Bait, he thought. *Bait.*

Who are they trying to catch?

He straightened, mouth dry, heart pumping rapidly. A sound at the wall to his left brought him whirling around. The vat room's emergency computer panel had come to life, tapes beginning to turn, lights winking. A read-out board clattered.

But there was no operator!

Svengaard whirled to run from the room, collided with a blocky, unmoving shape. Arms and hands gripped him with unmerciful pressure and he saw beyond his captor, a section of the vat room wall open with dim light there and movement.

Then darkness exploded in his skull.

XIV

Seatac Hospital's new computer nurse got Max Allgood on the phone after only a short delay while Security traced him. Allgood's eyes appeared sunken. His mouth was pulled into a thin line.

"Yes?" he said. "Oh, it's you."

"Something important's come up," she said. "Svengaard's in the vat room examining the Durant embryo under microscope."

Allgood rolled his eyes. "Oh, for the love of . . . Is that why you got me out of . . . is that why you called me?"

"But there was a noise and you said . . ."

"Forget it."

"I tell you there was a com-

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motion of some kind in that room and now Doctor Svengaard's gone. I didn't see him go."

"He probably left by another door."

"There is no other door."

"Look, sweetie, I have half a hundred agents there covering that room like a blanket. A fly couldn't move in that room without our scanners picking it up."

"Then check with them to see where Svengaard's gone."

"Oh, for . . ."

"Check."

"All right!" Allgood turned to his hot line, got the duty agent. The computer nurse could hear him through her open line. "Where's Svengaard?"

A muffled voice responded: "Just went in and examined the Durant embryo under miscrocope, then left."

"Went out the door?"

"Just walked out."

Allgood's face came back onto the computer nurse's screen. "You hear that?"

"I heard, but I've been down at the end of the hall ever since he went in. He didn't come out."

"You probably turned your back for five seconds."

"Well . . ."

"You did, didn't you?"

"I may've looked away just for a second, but . . ."

"So you missed him."

"But I heard a commotion."

"If there was anything wrong, my men would've reported it. Now, forget this. Svengaard's no problem. *They* said he'd probably do this and we could ignore it. They're never wrong about such things."

"If you're sure."

"I'm sure."

"Say, why are we so interested in that embryo?"

"You don't need to know, sweetie. Get back to work and let me get some sleep."

She broke the connection, still wondering about the noise she had heard. It had sounded like something being hit.

Allgood sat staring at the blank screen after the nurse signed off. *Noise? Commotion?* He formed a circle with his mouth, exhaled slowly. *Crazy damn female!*

Abruptly, he stood up, turned back to his bed. The doxie playmate he'd brought in for the night lay there in the rosy light of a gloom dispeller, half awake, looking at him. Her eyes under long lashes filled him with sudden rage.

"Get the hell out of here!" he roared.

She sat upright in the bed, wide awake, staring.

"Out!" he said, pointing to the door.

She tumbled out of bed, grab-

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bed her clothing and ran out the door, a flash of pink flesh.

Only when she'd gone did Allgood realize who she'd reminded him of — Calapine, a dull Calapine. He wondered at himself then. The Cyborg had said the adjustments they made, the instruments they'd implanted, would help him control his emotions, permit him to lie with impunity even to Optimen. This outburst now — it frightened him. He stared down at one of his slippers abandoned on the gray rug, its mate vanished somewhere. He kicked the slipper, began pacing back and forth.

Something was wrong. He could feel it. He'd lived almost four hundred *lovely* years, most of them in Optiman service. He had a well-trained instinct for rightness and wrongness. It was survival.

Something was wrong.

Had the Cyborg lied to him? Was he being used for some trick of their own?

He stumbled over the slipper.

Noise. Commotion.

With a low curse, he returned to the hot line, got his duty agent. The man's face on the screen looked like an infant — puffy lips and big, eager eyes.

"Go down to that vat room and inspect it," Allgood said. "The fine tooth. Look for signs of a commotion."

"But if anybody sees us . . ."

"Damn it to hell! Do as I say!"

"Yes, sir!"

The agent clicked off.

Allgood threw off his robe, all thought of sleep forgotten, ran through a quick shower and began dressing.

Something was wrong. He could feel it. Before leaving his quarters he put out a call to have Svengaard picked up and brought in for questioning.

XV

By eight a.m., the streets and speedwalks of Seatac's industrial district-north swarmed with machine and foot traffic — the jostling impersonals of people following the little strung-out channels of their private concerns. Weather control had said the day would be held to a comfortable seventy-eight Fahrenheit with no clouds. An hour from now, as the day settled into its working tempo, traffic would become more sparse. Dr. Potter had seen the city at that pace many times, but he had never before been immersed in the shift-break swarm.

He was aware that the Parents Underground had chosen this time for its natural concealment. He and his guide were just two more impersonals here. Who would notice them? This didn't

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subtract, though, from his fascinated interest in a scene that was new to him.

A big female Sterrie in the green-white striped uniform of a machine-press operator in the heavy industry complex pushed past him. She looked to Potter like a B2022419^{k}G8-cut with cream skin and heavy features. On a gold loop in her right ear she wore a dancing doll breeder fetish.

Almost in lock step behind her trotted a short man with hunched up shoulders carrying a short brass rod. He flashed an impish grin at Potter as they passed, as much as to say: "Here's the only way to get through a crowd like this."

Potter's guide turned Potter aside onto the step-down walk and then into a side street. The guide was an enigma to Potter, who couldn't place the cut. The man wore a plain brown service suit, coveralls. He appeared reasonably normal except for a pale, almost sickly skin. His deeply set eyes glittered almost like lenses. A skull cap concealed his hair except for a few dark brown strands that looked almost artificial. His hands when they touched Potter to guide him felt cold and faintly repellent.

The crowd thinned here as the step-down walk rounded a corner into a by-way canyon between two towering windowless buildings. There was dust in this cavernous street, rising up and almost concealing a distant tracery of bridges. Potter wondered at the dust. It was as though the director of local weather allowed dust here in an unconscious passion for naturalness.

A bulky man hurried past them and Potter was caught by the look of his hands — thick wrists, bulging knuckles, horned callouses. He had no idea what work could cause such deformity.

The guide steered them now onto a succession of drop walks and into the cave of an alley. The swarm was left behind. A feeling of detachment seized Potter. He felt he was reliving an old and familiar experience.

Why did I come with this person? he wondered.

The guide wore the wheeled blazon of a transport driver on his shoulder, but he'd said right out he was from the Parents Underground.

"I know what you did for us," he'd said. "Now we will do something for you." A turn of the head. "Come."

They'd talked only briefly after that, but Potter had known from the first the guide had correctly identified himself. This was no trick.

Then why did I accept the in-

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vitation? Potter asked himself. Certainly it wasn't for the veiled promises of extended life and instant knowledge. There were Cyborgs behind this, of course, and he suspected this guide might be one of them. Most of the Optimen and Servant Uppers tended to discount the Folk rumors that Cyborgs did exist, but Potter had never joined the cynics and scoffers. He could no more explain why than he could explain his presence here in this alley-cave walking between dark plasmeld walls illuminated by the ghost flicker of overhead glowtubes.

Potter suspected he had at last rebelled against one of the three curses of their age — moderation, drugs and alcohol. Narcopleasures and alcohol had tempted him in their time . . . and finally moderation. He knew it wasn't normal for the times. Better to take up with one of the wild sex cults. But pointless sex without even the faint hope of issue had palled on him, although he knew this for a sign of final dissolution.

The alley opened into one of the lost squares of the megalopolis — a triangular paving and fountain that looked to be real stone, green with the slime of ages.

The Optimen don't know about this place, Potter thought. They despised stone which eroded and wore away — in their time. Regenerative plasmeld was the thing. It stood unmoved and unmoving for all time.

The guide slowed as they reached the open air. Potter noted a faint smell of chemicals about the man, oily sweetness, and a tiny scar running diagonally down the back of his neck into his collar.

Why didn't he try to blackmail me into coming? Potter wondered. *Could he be that sure? Could anyone know me that well?*

"We have a job for you," the guide had said. "An operation you must perform."

Curiosity is my weakness, Potter thought. *That's why I'm here.*

The guide put a hand on Potter's arm, said: "Stop. Wait."

The tone was conversational, calm, but Potter felt hidden tensions. He looked up and around. The buildings were windowless, faceless. A wide door stood out in the angle of another alleyway ahead. They had come almost around the fountain without encountering another person. Nothing stirred or moved around them. There was only the faint rumbling of distant machinery.

"What is it?" Potter whispered. "Why're we waiting?"

"Nothing," the guide said. "Wait."

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Potter shrugged.

His mind veered back to the first encounter with this creature. *How could they know what I achieved with that embryo? It must be the computer nurse. She's one of them.*

The guide had refused to say.

I came because I hoped they could help me solve the mystery of the Durant embryo, he thought. *They were the source of the arginine intrusion — that's what I suspect.*

He thought of Svengaard's description — a contrail-like intrusion. It had deposited arginine-rich sperm protamine through the coiled alpha-helices of the embryo's cells. Then had come the operation — the cysteine masked, neutralized with sulfhydryl and the ATP phase . . . oligomycin and azide . . . the exchange reaction inhibited.

Potter stared up at the patch of blue sky framed by the buildings around the square. His mind, concentrated on the Durant cutting, had encountered a new idea. He no longer saw the sky. His awareness was back within the swarming cell structure, following the mitochondrial systems like an undersea hunter.

"It could be repeated," Potter whispered.

"Silence," the guide hissed.

Potter nodded. *On any embryo at all,* he thought. *The key's the arginine flooding. I could duplicate that myself on the basis of Sven's description. Gods! We could make billions of Durant embryos! And every one of them self-viable!*

He took a deep breath, dismayed by the realization that — with the record tape erased — his memory might be the only container of that entire operation and its implications. Svengaard and the computer nurse could have only part of it. They hadn't been *in* there, immersed in the heart of the cell.

A brilliant surgeon might deduce what had happened and be able to reproduce the operation from the partial records, but only if he were to set the problem. Who would ever take up this problem? Not the Optimen. Not that dolt Svengaard.

The guide tugged at Potter's arm. Potter looked down into that flat, chill-eyed face with its lack of genetic identification.

"We are observed," the guide said in an oddly depersonalized tone. "Listen to me very carefully. Your life depends on it."

Potter shook his head, blinked. He felt removed from his own person, become only a set of senses to record this man's words and actions.

"You will go through that door ahead of us," the guide said.

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Potter turned, looked at the door. Two men carrying paper-wrapped parcels emerged from the alley in front of it, hurried around the square opposite them. The guide ignored them. Potter heard a babble of young voices growing louder in the alley. But the guide did not pay any attention to these either.

"Inside that building, you will take the first door on your left," he said. "You will see a woman there operating a voicebox. You will say to her: 'My shoe pinches.' She will say: 'Everyone has troubles.' She will take care of you from there."

Potter found his voice: "What am I supposed to do if she's not there?"

"Then go through the door behind her desk and out through the adjoining office into a rear hall. Turn left and go to the rear of the building. You will find there a man in a loader supervisor's uniform, striped gray and black. When you find him, you will repeat the procedure with him."

"What about you?" Potter asked.

"That is not your concern. Quickly, now!"

The guide gave him a push that sent him hurtling forward.

Potter stumbled toward the door just as a woman in a teacher's uniform emerged from the alley leading a file a children across between him and the bolt hole.

Potter's shocked senses took in the scene — children, all dressed in tight shorts that revealed their long flamingo legs. They were all around him suddenly and he was bulling his way through toward the door.

Behind him, someone screamed.

Potter lurched against the door, found the handle, turned and looked back.

His guide had gone around to the opposite side of the fountain which concealed him now from the waist down, but what remained visible was enough to make Potter gasp and freeze. The man's chest was bare, revealing a single milky white dome from which blazed a searing light.

Potter turned left and saw a line of men emerging from another alley to be crisped and burned down by that searing light. The children were shouting, crying, falling back into the alley from which they had emerged, but Potter ignored them, fascinated by this slaughter-machine which he'd thought was a human being.

One of the guide's arms lifted, pointed overhead. From the extended fingers, lancets of searing blue stabbed upward. Where the light terminated, aircars tumbled

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from the sky. The air all around had become an ozone-crackling inferno punctuated by explosions, screams, hoarse shouts.

Potter stood there watching, unable to move, forgetful of his instructions or the door or his hand upon the door's handle.

Return fire was coming now at the guide. His clothing shriveled, vanished in smoke to reveal an armored body with muscles that had to be plasmeld fibers. The ravening beams continued to blaze from his hands and chest.

Potter found he no longer could bear to watch. He wrenched the door open, stumbled through into the relative gloom of a yellow-walled foyer. He slammed the door behind him as an explosion rocked the building. The door rattled.

On his left, a door was flung open. A tiny blue-eyed blonde woman stood there staring at him. Potter found himself oddly recognizing the markers of her genetic cut, reassured by the touch of humanity in these tiny betrayals. He could see the cabinet of a voicebox in the room behind her.

"My shoe pinches," Potter said.

She gulped. "Everyone has troubles."

"I am Dr. Potter," he said. "I think my escort has just been killed."

She stepped aside, said: "In here."

Potter lurched past her into an office with lines of empty desks. His mind was a turmoil. He felt shaken to his roots by the implications of the violence he had just witnessed.

The woman took his arm, herded him toward another door. "Through here," she said. "We'll have to go into the service tubes. That's the only way. They'll have this place surrounded in minutes."

Potter stopped, figuratively dug in his heels. He hadn't counted on violence. He didn't know what he had expected, but not that.

"Where're we going?" he demanded. "Why do you want me?"

"Don't you know?" she asked.

"He . . . never said."

"Everything'll be explained," she said. "Hurry."

"I don't move a millimeter until you tell me," he said.

A raw street oath escaped her lips. She said: "If I must I must. You're to implant the Durant embryo in its mother. It's the only way we can get it out of here."

"*In* the mother?"

"In the ancient way," she said. "I know it's disgusting, but it's the only way. Now hurry!"

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Potter allowed himself to be herded through the door.

XVI

In the control center, their Survey Globe, the Tuyere occupied the thrones on the pivoting triangle, reviewing data and reviewing data — correlating, deducing, commanding. The 120-degree scan of curved wall available to each of them flashed with data in numerous modes — pictorially in the spying screens, as probability function in mathematical read-outs, as depth-module decision analogues, as superior/inferior unit apportionments pictured in free-flowing pyramids, as visual reports reduced to cubed grids of binaries according to relative values, as motivational curves weighted for action/reaction and presented in flowing green lines . . .

In the upper quadrants, scanner eyes glittered to show how many of the Optimen were sitting-in on the globe's activity — there were over a thousand this morning.

Calapine worried the prescription ring on her left thumb, felt the abortive hum of power in it as she twisted and slid it along her skin. She felt restless, full of demands for which she could find no names. The duties of the globe were becoming repellant, her companions hateful. In here. Time settled into more of a continuous blur without days or nights. Every companion she had ever known grew to be the same companion, merged, endlessly merged.

"Once more have I studied the protein synthesis tape on the Durant embryo," Nourse said. He glanced at Calapine in the reflector beside his head, drummed the arm of his throne with fingers that moved back and forth on the carved plasmeld.

"Something we've missed, something we've missed," Calapine mocked. She looked at Schruille, caught him rubbing his hands along his robe at his thighs, a motion that seemed filled with stark betrayal of nervousness.

"Now it happens I've discovered the thing we missed," Nourse said.

A movement of Schruille's head caught Nourse's attention. He turned. For a moment, they stared at each other in the prisms. Nourse found it interesting that Schruille betrayed a tiny skin blemish beside his nose.

Odd, Nourse thought. *How could one of us have a blemish such as that? Surely there, could be no enzymic imbalance.*

"Well, what is it?" Schruille demanded.

"You've a blemish beside your nose," Nourse said.

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Schruille stared at him.

"You deduce this from the embryo's tape?" Calapine asked.

"Eh? Oh . . . no, of course not."

"Then what is it you've discovered?"

"Yes. Well . . . it seems rather obvious now that the operation Potter performed may be repeatable — given that general type of embryo and proper administration of sperm protamine."

Schruille shuddered.

"Have you deduced the course of the operation?" Calapine asked.

"Not precisely, but in outline, yes."

"Potter could repeat it?" she asked.

"Perhaps even Svengaard."

"Guard and preserve us," Calapine muttered. It was a ritual formula whose words seldom caught an Optiman's conscious attention, but she heard herself this time. The word "preserve" stood out as though outlined in fire.

She whirled away.

"Where is Max?" Schruille asked.

The whine in Schruille's voice brought a sneer to Nourse's lips.

"Max is working," Nourse said. "He is busy."

Schruille looked up at the watching scanners, thinking of all their fellows behind those lensed eyes — the Actionists seeing events as a new demand upon their talents, not realizing what violence might be unleashed here; the Emotionals, fearful and complaining, rendered almost ineffective by guilt feelings; the Cynics, interested by the new *game* (most of the watchers, Schruille felt, were Cynics); the Hedonists, angered by the current sense of urgent emergency, worried that such matters interfered with their enjoyments, and the Effetes, looking in all this for something new at which to sneer.

Will we now develop a new party? Schruille asked himself. *Will we now have the Brutals, all sensitivity immured by the needs of self preservation? Nourse and Calapine haven't faced this as yet.*

Again he shuddered.

"Max calls," Calapine said. "I have him in my transient screen."

Schruille and Nourse flicked their channel duplicators, looked down at Allgood's swarthy, solid, muscular figure in the transient screen.

"I report," Allgood said.

Calapine watched the Security chief's face. He appeared oddly distracted, fearful.

"What of Potter?" Nourse asked.

Allgood blinked.

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"Why does he delay his answer?" Schruille asked.

"It's because he worships us," Calapine said.

"Worship is a product of fear," Schruille said. "Perhaps there's something he wishes to show us, a projection or an evidential subdatum. Is that it, Max?"

Max Allgood stared out of the screen, looking from one to the other. They'd gotten tied up in that lost-time sense again, the endless word play and disregard for Time in the quest for data, data, data — that side effect of endless life, the supra-involvement in trivia. This time, he hoped it would go on forever.

"Where is Potter?" Nourse demanded.

Allgood swallowed. "Potter has . . . temporarily eluded us." He knew better than to lie or evade.

"Eluded?" Schruille asked.

"How?" Nourse asked.

"There was . . . violence," Allgood said.

"Show us this violence," Schruille said.

"No," Calapine said. "I will take Max's word for it."

"Do you doubt Max?" Nourse asked.

"No doubts," Schruille said. "But I will see this violence."

"How can you?" Calapine asked.

"Leave if you wish," Schruille said. He measured out his words: "I . . . will . . . see . . . this . . . violence." He looked at Allgood. "Max?"

Allgood swallowed. This was a development he had not anticipated.

"It happened," Nourse said. "We know that, Schruille."

"Of course it happened," Schruille said. "I saw the mark where it was edited out of our channels. Violence. Now I wish to bypass the safety valve which protects our sensitivities." He snorted. "Sensitivities!"

Nourse stared at him, noting that all traces of a whine had gone from Schruille's voice.

Schruille looked up at the scanners, saw that many were winking off. He was disgusting even the Cynics, no doubt. A few remained, though.

Will they stay through to the end? he wondered.

"Show the violence, Max," Schruille ordered.

Allgood shrugged.

Nourse swiveled his throne around, putting his back to the screen. Calapine put her hands over her eyes.

"As you command," Allgood said. His face vanished from the screen, was replaced by a high view looking down into a tiny square between windowless buildings. Two tiny figures walked around a fountain in the square.

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They stopped and a close-up showed the faces — Potter and an unknown, a strange looking man with frighteningly cold eyes.

Again the long view. Two other men were emerging from an alley carrying paper-wrapped packages. Behind them trooped a file of children with an adult monitor in teacher's uniform.

Abruptly Potter was lurching, pushing through the children. His companion was running the other way around the fountain.

Schruille risked a glance at Calapine, caught her peeking between her fingers.

A shrill, piercing cry from the screen brought his attention jerking back.

Potter's companion had become a thing of horror, clothing fallen away, a milky bulb arising from his chest to flare with brilliant light.

The screen went blank, came alive again to a view from a slightly different angle.

A quick glance showed that Calapine had dropped all pretense of hiding her eyes, was staring at the screen. Nourse, too, watched through his shoulder prism.

Another blaze of light leaped from the figure in the screen. Again the screen went blank.

"It's a Cyborg," Schruille said. "Know that as you watch."

Again the scene came alive from a different angle and this time from very high. The action in the plasmeld canyon was reduced to a movement of midges, but there was no difficulty in finding the center of violence. Lancets of blazing light leaped upward from a lurching figure in the square. Aircars exploded and fell from the sky in pieces.

One Security vehicle plummeted in behind the Cyborg. A pulsing beam of coherent light emerged from it to cut a smoking furrow down the side of a building. The Cyborg whirled, lifted a hand from which a blinding blue finger seemed to extend into infinity. The finger met the diving car, split it in half. One half hit a building, ricocheted and smashed into the Cyborg.

A ball of yellow brilliance took shape in the square. In a second, a reverberating explosion shook the scene.

Schruille looked up to find the circle of watching scanners complete, every lensed eye blazing red.

Calapine cleared her throat. "Potter went into that building on the right."

"Is that all you can say?" Schruille asked.

Nourse swiveled his throne, glared at Schruille.

"Was it not interesting?" Schruille asked.

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"Interesting?" Nourse asked.

"It is called warfare," Schruille said.

Allgood's face reappeared on the screen, looking up at them with a veiled intensity.

He's naturally curious at our reaction, Schruille thought.

"Do you know of *our* weapons, Max?" Schruille asked.

"This talk of weapons and violence disgusts me," Nourse said. "What is the good of this?"

"Why do we have weapons if they were not intended for use?" Schruille asked. "Do you know the answer, Max?"

"I know of your weapons," Allgood said. "They are the ultimate safeguard for your persons."

"Of course we have weapons!" Nourse shouted. "But why must we . . ."

"Nourse, you demean yourself," Calapine said.

Nourse pushed himself back in his throne, hands gripping the arms. *Demean myself!*

"Let us review this new development," Schruille said. "Cyborgs we knew existed. They have eluded us consistently. Thus, they control computer editing channels and have sympathy among the Folk. Thus, we see, they have an Action Arm which can sacrifice . . . I say *sacrifice* a member for the good of the whole."

Nourse stared at him, wide-eyed, drinking the words.

"And we," Schruille said, "we had forgotten how to be thoroughly brutal."

"Faaah!" Nourse barked.

"If you injure a man with a weapon," Schruille said, "which is the responsible party — the weapon or the one who wields it?"

"Explain yourself," Calapine whispered.

Schruille pointed to Allgood in the screen. "There is our weapon. We've wielded it times without number until it learned to wield itself. We've not forgotten how to be brutal, we've merely forgotten that we *are* brutal."

"What rot!" Nourse said.

"Look," Schruille said. He pointed up to the watching scanners, every one of them alive. "There's my evidence," Schruille said. "When have so many watched in the globe?"

A few of the lights began to wink out, but came back as the channels were taken over by other watchers.

Allgood watching from the screen felt the thrill of complete fascination. A tight sensation in his chest prevented deep breaths, but he ignored it. The Optimen facing violence! After a lifetime playing with euphemisms, Allgood found the thought of this almost unacceptable. It had been

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so swift. But then these were the live-forevers, the people who could not fail. He wondered then at the thoughts which raced through their minds.

Schruille, the usually silent and watchful, looked down at Allgood, said: "Who else has eluded us, Max?"

Allgood found himself unable to speak.

"The Durants are missing," Schruille said. "Svengaard has not been found. Who else?"

"No one, Schruille. No one."

"We want them captured," Schruille said.

"Of course, Schruille."

"Alive," Calapine said.

"Alive, Calapine?" Allgood asked.

"If it's possible," Schruille said.

Allgood nodded. "I obey, Schruille.

"You may get back to your work now," Schruille said.

The screen went blank.

Schruille busied himself with the controls in the arm of his throne.

"What're you doing?" Nourse demanded and he heard the petulance in his own voice, despising it.

"I remove the censors which excluded violence from our eyes except as a remote datum," Schruille said. "It is really time that we observed the reality of our land."

Nourse sighed. "If you feel it's necessary."

"I know it's necessary."

"Most interesting," Calapine said.

Nourse looked at her. "What do you find interesting in this obscenity?"

"This exhilaration I feel," she said. "It's most interesting."

Nourse whirled away from her, glared at Schruille. He could see now that there definitely was a skin blemish on Schruille's face — beside his nose.

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PRICELESS POSSESSION

by ARTHUR PORGES

They were intelligent and worthy of Man's respect. Too bad that they were a valuable commodity!

When Lieutenant Garret got the summons from the Control Room, his first thought was that the captain had died. What else could account for the excited note in the ensign's voice? He swung himself out of his berth, zipped through the passage and snapped: "What is it, Luis? Drug no good? Is the captain —"

Garcia looked at him so blankly that Garret bit off the end of his question.

"Drug?" the boy repeated. He seemed almost dazed. "No, it's not the skipper. I wanted permission to change course. You'll think I'm crazy, Lieutenant, but so help me, we're almost ramming an S-2. It's hardly four degrees off our course-vector."

"An S-2! We should be that lucky! The last was taken eleven — no, fourteen years ago. You must be hallucinating, boy."

"That's what I figured at first. But the sail began to show up on the micro-screen. A big one, if I'm not seeing things. Damned big."

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He heard the lieutenant whistle softly, and knew why.

In 1870, a whaler — or beachcomber — who found a large chunk of that mysterious substance, ambergris, was a fortunate fellow, sure to make a lot of money from his discovery. In 2270, a comparable but even rarer and more valuable windfall was the taking of an S-2, or Solar Sailor.

The first had been spotted in 2164. It knocked the world of science off balance for years to follow. The notion that any organism could live and grow in airless, irradiated, non-temperatured space was so novel and hard to accept that the crew of the *Hakluyt* were long called hoaxers, who with fake photos were amusing themselves at the public's expense.

However, after several more of the weird creatures had been seen, the evidence built up beyond doubting. It was no longer possible to deny the truth.

The S-2, like the Portugese Man of War of Earth's seas, consists of a jelly-like body from which sprouts a sail that reacts to the pressure of light. The organism apparently lives by ingesting cosmic dust much as whales utilize plankton. It can furl or twist its sail — something never observed, but inferred — but quite slowly, having no muscles as such, and so guides its movement in space. Obviously, it must avoid getting trapped in a strong gravitational field, since it could never escape, and would either crash on a planet or be immolated in a sun. Of necessity, it cruises only where the impact of photons against the sail dominates the pull of matter.

Since all attempts to communicate with the organism were failures, the Galactic Council reluctantly classified it as a lower animal of inconsiderable consciousness, and lawful game.

As for the sail, the source of the creature's commercial value, it is the most remarkable fabric to be found in the whole galaxy, and almost beyond price. Thin and light as the finest spider-silk, it is stronger than the toughest synthetics, from nylon-gamma to durette; and can be cut only with power shears of concillium alloy. It is fireproof, waterproof and unaffected by any chemical reagent, however concentrated. It is also a near-perfect conductor of electricity, having a resistance close to zero at all temperatures. Finally, the material shimmers rainbowlike under radiation of every wavelength, from cosmic rays to the longest members of the AM band. Whether for the most precise instruments or the gowns of multimillionaire wom-

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en, the fabric is so much in demand, and so scarce, that the price must be set by public auction.

Every attempt at duplication in the laboratory failed; and it is thought that the missing factor may be time. It might take an S-2 a thousand years to grow its sail, one molecule at a time, under the rays of many classes of stars, in the hard vacuum of space — and such conditions aren't to be simulated in any laboratory.

The note of excitement in Alvarez' voice was now accounted for. Aside from the basic drama of the find, the boy saw barriers dropping in all directions. He saw, too, in his mind's eye, the lovely face of Julia Marlowe, whose father was a senior member of the Galactic Council, and not likely to let his daughter marry a penniless ensign. She was fond enough of the boy, approving his darkly handsome face and muscular body; but she spent more on cosmetics and perfume than he earned. She was beautiful, gay, generous and sweet, but there was plenty of her father's iron in the girl, and she would never settle down to live on love alone.

But now that he was about to be one-third owner of a huge S-2 sail . . .

Garret had been studying the image on the screen, his pale, glittering eyes a glacial blue.

"You're right, by God — I didn't believe it until this minute! Luis, do you know what that lovely beastie out there means to us?"

The lieutenant knew what it meant to *him*, all right. He was over age in grade, and soon to be retired on the usual pittance. A first-rate fighting man, brave, quick-witted and up to every dirty dodge of battle, it was only his lack of self-control that kept him from climbing. Thick-set, blocky, with hot, intolerant eyes, he always preferred a blow to a word: tops in a messy brawl, but never seeing more than ten minutes ahead.

"Do I?" the ensign replied to Garret's question. "It means about a million credits, at least — a three-way split. If the captain lives," he added quickly. "And then I can ask Julia to marry me."

"Good for you," the lieutenant said, only half-hearing. He was thinking what his own share would do. No more worry about living on his retirement pay, or taking some job that exploited his former rank and cluster of decorations. A life of luxury was now the prognosis: wine, women — he could do without song; the rustle of large denomination bills

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was the most musical sound of all.

"Well," Alvarez said, grinning hugely. "What are we waiting for? They say a laser beam in that big bluish spot just off center kills the thing dead. And no risk of hurting the sail — as if anything could."

"Right. Move in now. We should be within range in an hour. The first in fourteen years," he murmured gloatingly. "They may be practically extinct, even with the few taken. Or bunched up in some other galaxy; the ones captured here might be real wanderers." He made some careful measurements with the micrometers, and said in an exultant voice: "I make the dimensions of this sail as giving five hundred square feet. And it should bring in a lot more than the last, because they've gone without so long. Million credits, hell — if this doesn't net us twice that at the auction, I'll eat the jelly part — no bread!"

The ensign manipulated the controls, and the ship began to converge on the S-2. Then the captain's voice, weak but lucid, came over the intercom.

"Lieutenant Garret," it said. "Please come to my quarters at once. Alvarez, too."

"Say," the boy said. "The new drug's working. He sounds fine. Kill or cure, the medicos said, and they were right. He'd be dead without it — you saw how bad he was."

"This is a lucky day all around," the lieutenant said. "One quickie course in Medical Techniques, and you save the skipper's life; not bad. Well, put the ship on auto again, and let's go. This news ought to complete the cure."

When they came in, Captain Ling was struggling to a sitting position; his eyes were feverishly bright, and he panted.

"There's Something outside," he gasped. "It's been communicating with me — mentally."

They gaped at him.

"What is?" the boy demanded.

"An S-2," the captain said. "Didn't you spot it? What kind of a watch you two keeping while I — never mind. Maybe it's still too far off. Anyhow, it was telling a friend. 'I'm going to die soon; the Killers are near, and must have detected me. We can't communicate with them, and they always destroy us; I don't know why. Good-by —" I didn't get the other's name, if it has one. It was so far away . . . another galaxy. I think. Yet they were in touch instantly."

"You're hallucinating. Captain." Garrett said. "You know very well that nobody's ever talked to an S-2. They're just space

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jellyfish — lower animals. Weird and wonderful, but no more intelligent than a worm."

Ling propped himself up, lips narroding.

"Is there an S-2 out there or not?"

"Yes, sir," the lieutenant admitted reluctantly. He gave the captain a lowering stare. "Telepathy is known to occur among humans. It's not subject to control, but does exist. You must have caught some of my thoughts — or Luis's. That has to be it."

Ling looked bewildered; he was still very ill, and not thinking clearly. He sank back in his bunk, breathing heavily.

"Maybe you're right, but we must be sure. Don't kill it; you mustn't. That's an order," he said, his voice hardening.

"But, Captain," his exec protested. "The S-2 is officially classified as a lower animal, subject to capture — legitimate game. Your order is actually illegal. I don't have to remind you, sir, what such a find is worth. Your share would be at least —"

"Never mind that," Ling snapped. "I'm in command, Lieutenant. If an order's illegal, you know the regulations: obey it, and complain later. I shouldn't have to point that out to an officer of your experience."

"But we'll lose the thing!" Garret said angrily. "Maybe you don't care, but I'm not passing up a fortune — one of the few a serviceman can get. Everything else the civvies latch on to, while we must settle for wages!"

Ling's eyes widened at Garret's tone, but he merely said quietly: "You can follow it for a while. Maybe I can make contact again."

"I'm sure it was the new drug, Captain," Alvarez suggested. "You were so far gone we took a chance on that new stuff — the psychic energizer. It gave you hallucinations."

"But it was all so clear — and logical," Ling said, almost to himself. "They live very slowly compared to us, sailing from one universe to another — across those incredible gaps we haven't dared to tackle yet. They avoid matter; maybe that's why we've found so few. They daren't get trapped by a gravity field. That small mass of theirs — it takes milennia to build up from cosmic dust down into usable food. Their thoughts are too sluggish for us, and their motions, too. They just can't signal in time to ask our mercy. Helpless — it's a terrible thing. If only I could slow my thinking down to match . . . we can record speech, and run that at any speed, but thought . . ." He closed his eyes.

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"Just how will you make contact, then?" Garret demanded sullenly. "We can't follow it forever; we have a deadline of our own. Rigel III by next month, remember?"

"I don't know," the captain admitted, without opening his eyes. "I'm all muddled up right now. Nothing's coming through at the moment." Then his lids snapped up. "There's only one way, but it's obvious enough. You'll have to give me more of the new drug."

"But, Captain," Alvarez objected. "That's risky. You were lucky once. Why push it?"

"I have to. If that's the stuff to stir up nerve endings or get them synchronized somehow with an S-2's thoughts, I have to try it. I won't have it on my conscience that I let a highly intelligent being get killed by my crew. And a noble being, too. If you could have felt its personality! No hatred of us; a pure spirit . . ."

"I'd be pure, too, just floating alone in space," Garret said sourly. "But I have to live on Earth, and that costs money."

"You don't know what you're saying," Ling said. "You're not that callous. And there's more. They can't *do* anything; no organs for manipulation, but what minds! I could hear this one; he was building up a mathematical system. My specialty — and he lost me after the first five postulates! Think what we could learn! The theorem he was working towards would have unified electricity, gravitation, magnetism, elasticity, the nucleus — sounds wild, but I believe. I really do believe!"

"Not all math has practical significance," Garret said.

"Granted. But consider this one point. They've licked the communications problem. By some kind of thought exchange they converse over distances we can hardly conceive. When one buds — that's how they reproduce — the two drift apart for maybe fifty thousand years. The acceleration may be only .000001 meters per second squared, but you know how that builds up the velocity in time — simple integration. Yet father — and — call it 'son' — have no trouble talking across the void. Think how we need such a technique. Light's too slow for anything out of the piddling solar system itself. And we're stymied with it." He sat up again, jaw out. "I don't have to convince you, damn it. Ensign — give me the drug again: that's an order!"

There was no resisting the command, not in this navy. The boy looked at Garret, who scowled, then shrugged.

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When the second dose had been injected, the two men waited impatiently for a reaction. It came more quickly this time.

As soon as the captain began to recover, he said: "I'll prove it to you. If I can receive from the S-2, it can receive from me. I'll — I'll ask it to signal."

"Captain, that's crazy," said Garret. "What kind of signal could it give? It can't talk. It can't shoot off flares . . ."

"I'll ask it to furl its sail."

Garret hesitated. "We'll watch," he promised.

And watch they did, for hours, while the prospect of the money began to grow larger in both their minds.

"A million credits," said Alvarez.

"More than that. Twice that much."

"And it's all out there waiting for us. Can't get away. Wonder if it's smart enough to run anyway? Not that it could; you move pretty slow, sailing that way, with just a push from light-beams. It's as good as ours, no matter what. Two million credits — ooh!"

Then he gulped, staring at the micrometer dial, which was zeroed in on the sail's upper right-hand corner. "Oh, no!"

"What?" the lieutenant barked, bringing his thoughts back from a pleasure-palace on Rigel II, where a little money bought delights unknown on earth.

"It's furling! So help me God, it is — look! We'd better tell the captain right away."

He reached for the intercom, but Garret put a thick hand on his wrist.

"Hold it a minute. We need to make sure. Give it more time — while we talk."

But for many minutes they said nothing; just stared as the sail, curling very slowly, as a flower might, began to bring one corner down. After the motion left no doubt, Alvarez stirred restlessly; again the lieutenant restrained him.

"Listen," he said. "I'll make this linear — not a curve. And strictly negative on the memory-cube. I'll deny saying it, officially." His dark face was grim. "All right; the thing's signalling; it has some sense. But it's not human — not like us; just a damned jelly-fish. No matter what the Single Universe cloud-heads say, I don't call every weird blob my brother just because it knows the multiplication table! There's a fortune out there a real life for us. Gonna let it get away?"

"B — but," the boy stammered. "What about communication? That's just as valuable. We could make a pile."

"We? Don't be stupid! The lab

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boys would have to work on the S-2 for years, maybe. And after they get the idea, how long to duplicate it? And who knows even if the drug would act the same on another guy? We could have long, gray beards before it's all worked out — and still have no claim, either." He gave the ensign a steady, cold stare. "I'll talk to the captain; you back me — okay?"

Alvarez hesitated briefly, then said: "Okay."

"Let's go down; we can talk some more on the way."

They entered the cabin, and Ling peered at them.

"Sick," he mumbled. "Damned stuff hits my guts now." He managed to sit up. "Well? What happened? You must have seen it. The S-2 told me it had furled."

"I'm sorry, Captain," Garret said, his face open and honest, gaze steady. "Nothing happened. We watched very closely. Not the slightest sign of a signal. In fact, the thing opened its sail further and was moving off our course — running away, obviously. Or trying to; but it's just too slow. An animal reaction, I'd say. Lower animal escaping instinctively. You had hallucinations from that drug. Right, Alvarez?"

His face pale, the boy said: "That's right, Captain. No sign of any intelligent response. You must have dreamed up the whole exchange. It's a pity," he sighed.

"I should have known," Ling said bitterly, settling back in his bunk. "Some mighty good men tried to communicate — like Duclaux of the old *Josiah Willard Gibbs*—and couldn't get through. Just a drug, after all. Well," he said, looking at them owlishly, "I've held up your jackpot long enough. Go get your millions!"

"*Our* jackpot," Garret said. "And it's a big one, Captain. Your share will buy you that estate you've mentioned so often — that, and a whole lot more."

"I'd sooner have found what I thought was out there. But at least my conscience is clear."

Outside the cabin, the two officers exchanged glances.

"*His* conscience is clear," the lieutenant said. "And mine isn't worth two-thirds of a million credits." He put his hand on the boy's shoulder. "Your people have a saying I like: "Take what you want—and pay for it."

"I know that one," Alvarez said wryly. "My father uses it quite a bit. And then Mother tells him: 'Ah, but when the bill finally comes, it may be too high.'" For a moment, as he spoke, his face, normally round and boyish, seemed old.

"On the other hand, sometimes the bill never comes," Garret said.

—ARTHUR PORGES

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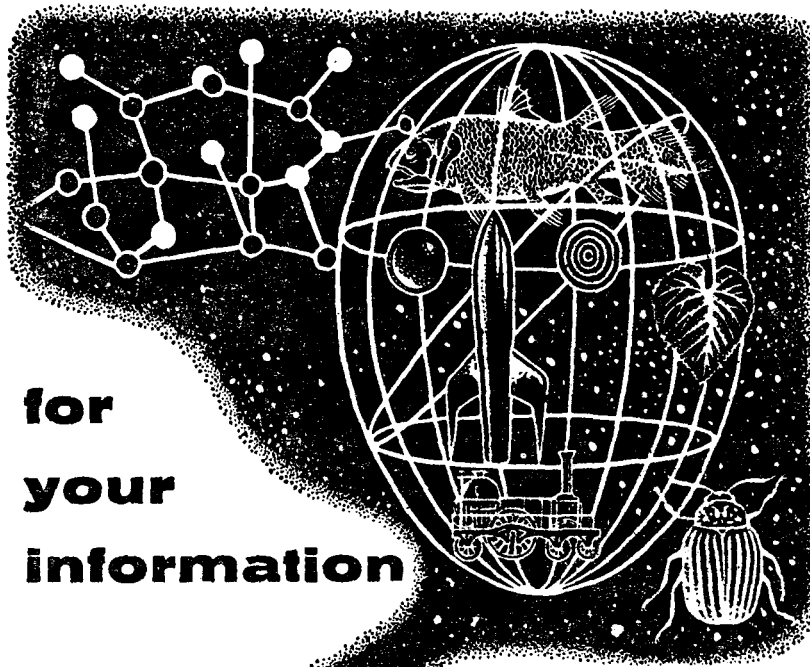

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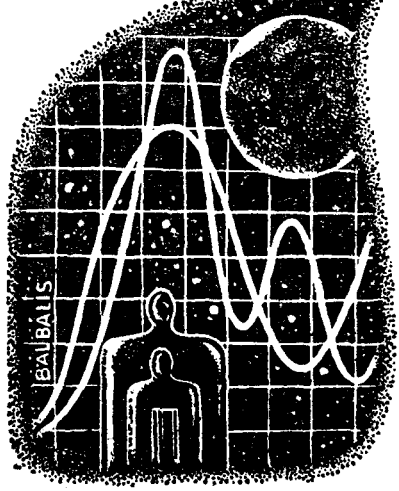

BROWNIAN MOTION, LOSCHMIDT'S NUMBER and the LAWS of UTTER CHAOS

Telegraph, telephone, radio, Kodak and Telstar have it in common that they are coined words, invented for the purpose of naming something that did not exist before, and most people know that they are coined words.

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But few are aware that the word "gas" is a coined word too, which differs from the others mainly in being much older, about three hundred and fifty years by now. No precise figure can be given because it is not known when it was coined. But we do know who coined it, namely the Flemish physician and experimenter Jan Baptista van Helmont. He was born in Brussels, probably in 1577 and died at Vilvoorde, not far from his birthplace, probably in 1644.

If Jan Baptista van Helmont had lived a century or two later, he would have been a greater scientist than he managed to be in his time. Van Helmont was a man of original ideas who made experiments never before performed, but he was handicapped by the general lack of chemical and physical knowledge of his time. One of van Helmont's original experiments—he is half-jokingly referred to as the "father of hydroponics" because of it—was to plant a small willow tree in a soil-filled tub. The soil had been carefully weighed before it was placed in the tub and nothing was ever added to it but plain water. Five years later the tree had gained 164 pounds but the soil had lost only two ounces—at least that is how van Helmont's figures translate into our system. A van Helmont of 1740 or 1840 would then have started an investigation into what the plant had "eaten" during those five years; the actual van Helmont concluded that the water had "hardened" into wood and leaves and quickly retrogressed to early Greek philosophical speculation.

But the tree-growing experiment was a side-issue. One of the investigations carried out by van Helmont dealt with a gas formed when wood was burned (our CO_2) and he came to the conclusion that this was something different from air, though similar in many respects. Since the normal vocabulary had words only for solid and liquid substances but lacked a word for substances like air, he coined the word "gas", from the Greek *chaos* the original meaning of which is "unformed".

At first the word gas was meant to be used for gases other than air (which, of course, was assumed to be homogeneous) but soon air was included. Unfortunately at a later date, say from 1750 until well into the nineteenth century, English-writing authors fell into the habit of writing "air" where we would say "gas". Joseph Black called carbon dioxide "fixed air", Henry Cavendish called hydrogen "flammable air" and others referred to nitrogen as "dephlogis-

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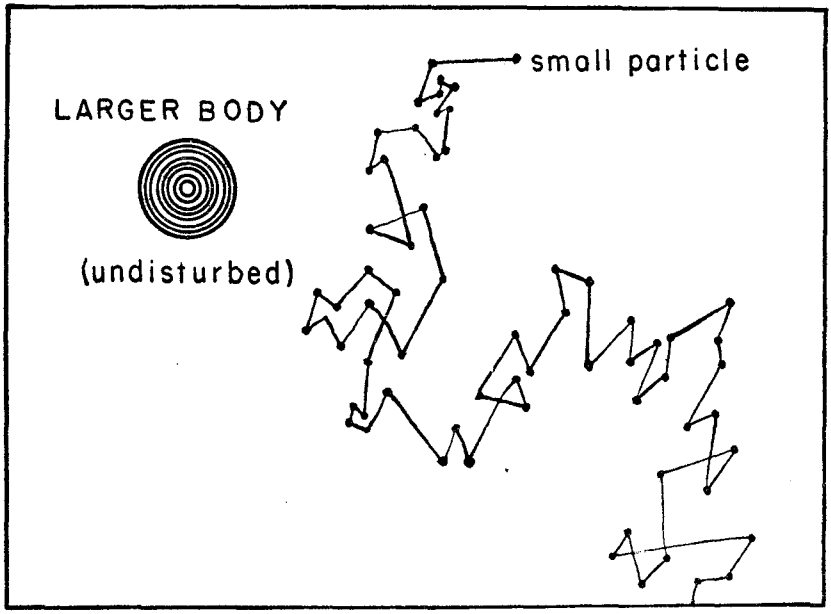

Fig. 1. The "Brownian motion" of a small particle in water, as seen under a microscope.

ticated air". Van Helmont's accomplishment was all but forgotten for a while.

His works were published after his death (in 1644) under the overall title *Ortus medicinae* (The Garden of Health) since he considered himself mainly a physician. But he has to be mentioned first when it comes to the exploration of the physical behavior of gases, for he gave them their name.

The second man to be considered was a botanist, though only later in his life. Born in Scotland on December 21, 1773 the boy was baptized by his father (an Anglican parson) Robert Brown, and in time Robert Brown began to study medicine. He then joined the army as a medical officer but gradually drifted into botany which was then closely allied to medicine.

As a botanist he became famous for discovering that every plant cell has a nucleus. In fact he invented the term, using the diminutive of *nuca,* the Latin word for "nut". But much of his

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fame rests on another discovery, one that has absolutely nothing to do with botany, though Robert Brown thought at first that it did.

One day in 1827 he looked at pollen floating in water. With the aid of his microscope, which he probably used because he intended to identify the pollen by their size and shape, he saw that they were in steady motion. It was an irregular motion, not leading anywhere, but they would not hold still for a moment. The fact that pollen behaved like this when immersed in water was new and Brown looked for an explanation. It occurred to him quickly.

Pollen grains, after all, were not dead matter. Fern or other plants would sprout from them in time. Since they were alive, the steady zig-zagging motion was caused by the "life force" which they harbored.

To us this is no explanation at all but an expression of a mistaken belief, but in 1827 it could still be advanced. It so happened that Brown, at a later date, observed the same kind of motion on particles of dye suspended in water. These particles certainly were not alive and never had been. Robert Brown dutifully reported his discovery in a scientific journal and admitted that he could not explain it. It is an interesting sidelight that Albert Einstein still wrestled with the mathematics of the explanation.

Actually the explanation for the "Brownian motion", as it came to be called was already in existence at the time the discovery was made. Brown either did not know about it, or else did not believe it. It is also possible that he knew of the explanation but did not think that it applied to his observation. That explanation was the atomic theory of John Dalton, first announced in 1803 and published with much detail in 1808.

Dalton's idea that all matter had to consist of atoms was an outgrowth of the belief held by Robert Boyle and Sir Isaac Newton that gases had to consist of discrete particles. And both Boyle and Newton had been impressed by work done by the Italian Evangelista Torricelli. Since Torricelli lived from 1608 to 1645, this brings us right back to the time of van Helmont, when most of the fundamental discoveries still had to be made.

Evangelista Torricelli was thirty years of age when he read the works of Galileo Galilei. Needless to say that he was much impressed, as was everybody who actually read Galilei's works, instead of just picking out a few sentences for the purpose

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of disputing them. Four years later he went to the Villa Arcetri (near Florence) where Galileo Galilei was "imprisoned" and stayed on as secretary and companion to the old and blind man. Galilei died three months later. But during that time there had been a discussion between the two that led to the work that made Torricelli famous.

Galilei still believed in the *horror vacui,* as it was then called, the notion that "Nature abhors a vacuum". There was "proof" for this. If you dipped a tube into water and then pulled a piston up the tube, the water rose in the tube. It could not stay behind, because in doing so a vacuum would have been created and since Nature did not permit a vacuum to exist, the water had to follow the piston.

But ordinary engineering experience, accumulated while building tall buildings, said that water could not be raised by more than 33 feet in this manner. Galileo Galilei suggested that Torricelli look into this problem.

Torricelli did and began to reason. Powerful winds could topple trees, hence air could exert a pressure. Wind pressure was a lateral phenomenon, but maybe air *always* exerted pressure downward. If so the pressure might only be enough to push water to a height of 33 feet, but not more.

That happens to be inconveniently large for easy experimentation; but there was a much heavier liquid known, namely mercury. Torricelli filled a bowl with mercury and then filled a glass tube, closed at one end, with the same metal. Then he turned the glass tube upside down and into the bowl of mercury. Some of the mercury promptly flowed from the tube into the bowl, but not very much. A column of mercury, 30 inches tall, remained in the glass tube.

Evidently air pressure was equivalent to the weight of 30 inches of mercury and the empty space above the mercury in the tube had to be that impossibility: a vacuum.

It is called a Torricellian vacuum to this day, even though it is not a very good vacuum because it contains mercury vapor.

This simple experiment produced a scientific revolution. If the air could exert only so much pressure it meant that it had only so much weight. This, in turn, meant that the atmosphere had to have only a certain height —and the concept of the air ocean was born. Blaise Pascal in France began to think about it and reasoned that, if that were true, the air pressure on top of a high mountain should be less

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than the air pressure in the lowlands. Pascal lived in the Auvergne and there was a mountain handy: the Puy-de-Dome. Since he was chronically sick the idea of climbing a mountain did not appeal to him—though the exercise might have done him a lot of good—and he charged his younger brother-in-law, one Monsieur Perier, with the task of carrying a Torricellian tube to the peak of the mountain. This was done in 1646 and it was found that the air pressure on top of the Puy-de-Dome (its height is 4790 feet) was actually less by about six inches than at its foot. Knowing this one could try to calculate the depth of the air ocean, or the height of the atmosphere and it was Dr. Edmond Halley in England who was one of the first to try to do so, proclaiming a three-layered atmosphere with a total height of 45 miles.

One man who was much intrigued by these findings was Otto von Guericke (1602-1686), Burgomaster of the city of Magdeburg. Intent on producing a vacuum he invented an air pump and in 1654, in Regensburg, he gave the spectacular demonstration consisting of two teams of horses trying to pull apart a metallic sphere, consisting of two hemispheres, from which the air had been evacuated. Otto von Guericke carefully studied air pressure and when, on December 5, 1660 he found that the air pressure was unusually low he predicted a storm—which promptly happened the following day.

Robert Boyle, born in December 1627 at Lismore Castle, Ireland, was one of the many children of the Earl of Cork. He was just thirty years old when he heard of von Guericke's air pump. He and his assistant, a then twenty-two year old young man by the name of Robert Hooke who later became Secretary of the Royal Society, tried to build a pump like von Guericke's and ended up with a better one.

Boyle knew, of course, that air can be compressed and he was interested in the relationship between volume and pressure. To find out he built a kind of adaptation of Torricelli's tube, a tube in which gas could be compressed by the weight of mercury. If he started out with a given volume of air and then doubled the amount of mercury the air was compressed to half its original volume.

As he put it in an appendix to his original publication (1662):

"It is evident, that as common air, when reduced to half its

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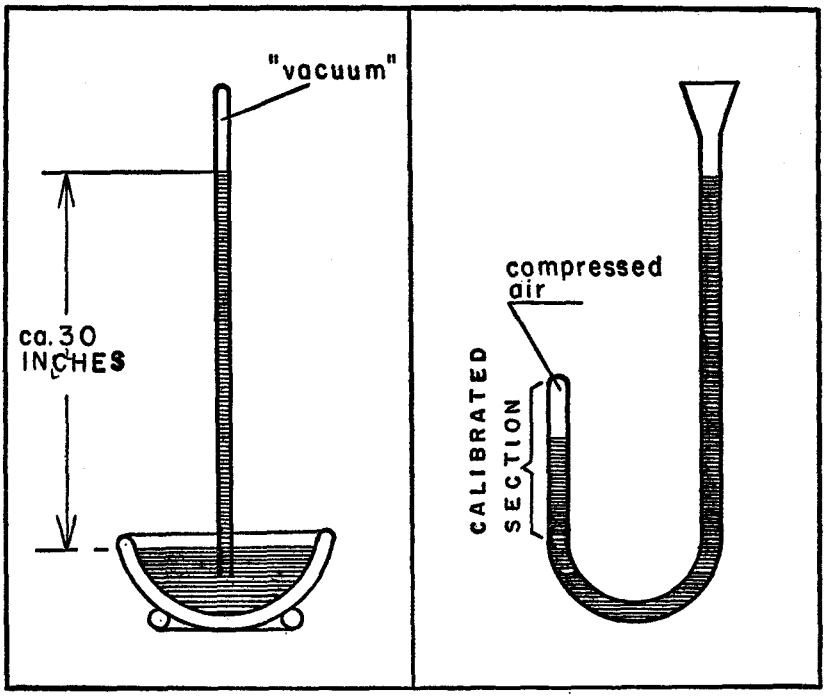

Fig. 2. Two mercury-filled glass tubes that shook the scientific world. At left Torricelli's tube, the later barometer, at right Robert Boyle's tube for compressing air.

wonted extent, obtained near about twice as forcible a spring as it had before; so this thus comprest air being further thrust into this narrow room, obtained thereby a spring about as strong again as that it last had, and consequently four times as strong as that of the common air. And their is no cause to doubt, that if we had been here furnished with a greater quantity of quick-silver and a very strong tube, we might, by a further compression of the included air, have made it counterbalance the pressure of a far taller and heavier cylinder of mercury."

What later became known as "Boyle's law" was simply the fact that tripling the pressure reduced the volume to one third, quadrupling it reduced the volume to one quarter and so forth. Boyle drew the logical conclu-

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sion: the air must consist of discrete particles with a vacuum between them. If you exerted pressure you forced the particles to be closer to each other.

With all his experiments about the "spring" of compressed air, Boyle lost sight of his original idea, namely to see whether a mercury column more than 30 inches in height would be counterbalanced. And he never gave a single thought to temperature. It was the French physicist Edme Mariotte who realized that Boyle's law held strictly true only if the temperature of the air did not change. Mariotte had learned that a volume of air expanded if the temperature increased and shrank if the temperature decreased—a discovery which finally led to the production of liquefied gases with all their numerous applications. As may be expected, Boyle's law, in French textbooks, is "Mariotte's law", and I am voting on the side of the French.

By the year 1700, then, it had been established that air had weight, that a vacuum was possible, that air could be artificially compressed into a smaller space and, finally, that it expanded when heated and contracted when cooled and that all that only made sense if one assumed that it consisted of separate particles. A solid, like lead, or a liquid, like water, did not seem to consist of separate particles since they could not be compressed. For a while, even after Mariotte, nobody noticed that a red-hot iron bar had a larger volume than a cold one.

The next chapter in the history of the gases is purely chemical. Jan Baptista van Helmont had discovered carbon dioxide, a gas other than air. Hydrogen was the next gas to be discovered. That there is a "flammable air" is first mentioned in the works of a Frenchman named Turquet de Mayerne—in the posthumous edition of his work, published in 1702. But the early investigator of hydrogen—though he cannot be called its discoverer — was Henry Cavendish. He was born in Nice on the Rivieria in 1731 because his mother, Lady Anne Cavendish, had gone there for her health. Henry Cavendish attended Cambridge University, but without obtaining a degree; he was interested in knowledge, not in degrees or titles. He also was a very strange man in all his habits. He could speak to only one person at a time and that only when that person was known to him and was male. Later in life he refused even to be in the same room with a woman and gave his instructions to his maids in writing. To round

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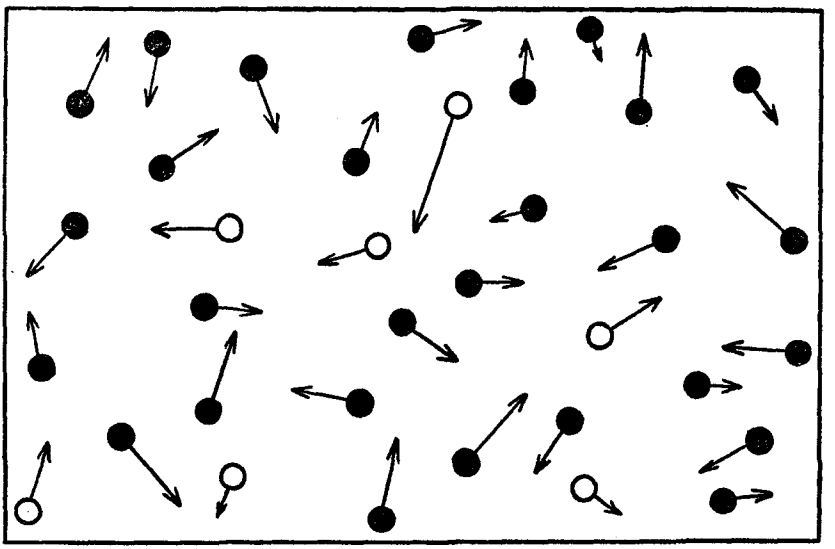

Fig. 3. A sample of air, magnified a few trillion times. Black stands for nitrogen, open circles for oxygen, arrows indicate direction of motion and (by their length) the velocity of motion.

out the picture he acquired two enormous inheritances from older relatives when he was himself over fifty; the fortunes were so large that the French physicist Jean Baptiste Biot called him: *le plus riche de tous les savants et le plus savant de tous les riches,* which can be (inadequately) translated as: "the richest of all the savants and the most knowledgeable of all the rich". And since he used far less than the interest on his fortune, he died being the largest depositor in the Bank of England.

Cavendish died at the age of seventy-nine—when he felt death approaching he sent his servants away so that he might die alone—and left a scientific legacy of work accomplished in astronomy, meteorology, metallurgy and a few other fields, but mainly chemistry. As for hydrogen, he had obtained it from metals by the action of acids, had carefully collected it over mercury and named it "flammable air from metals". He not only knew that it was flammable, he knew that it was far lighter than air—there-

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by establishing that different gases had different densities. He burned hydrogen, producing water and proved that way that water was not an element.

It was already known that air consisted of at least two gases, nitrogen (discovered in 1772 by the Scottish physician Daniel Rutherford) and oxygen (discovered by Antone Laurent Lavoisier in 1774 or 1775), and Cavendish found out that these two gases, merely mixed normally, could be forced into a chemical compound by the passage of electric sparks.

But no matter how much oxygen he added to a sample of nitrogen, there always remained a bubble that would not combine. It was argon, Cavendish missed an important discovery by a hair.

These discoveries, plus a few others (like the one by the French chemist Joseph Louis Proust — 1754-1826 — that each chemical compound contains its elements in definite proportions) paved the way for John Dalton, who arrived at the conclusion that *all* matter, and not just gases, had to consist of atoms. Of course it was thought at first that only two atoms would get together for the simpler compounds. The "fixed air" of Joseph Black was thought to have the formula CO (instead of CO_2), and water was believed to be HO (instead of H_2O). But even so it was impractical to talk about an "atom" of water, or a "compound atom" as some phrased it. It was Count Amadeo Avogadro (1776-1856) who coined the term molecule, the meaning being "small bundle". He also suggested that even the elements came in molecules, containing more than one atom as a rule.

Strangely enough the atomic theory of Dalton, which constituted a scientific revolution, was accepted quietly—while Avogadro's idea of molecules, which was merely a refinement, caused violent opposition.

After this interlude, during which gases were treated mainly as chemicals, physics began to reassert itself. The turning point was around the middle of the nineteenth century.

An important point was that both Avogadro and Andre Marie Ampere (1775-1836) had independently arrived at the conclusion that a given volume of a gas, at a given temperature, would contain the same number of atoms (molecules) *regardless of the nature of the gas*. Naturally, that brought up the question: how many?

Again we have to backtrack.

Jacques Alexandre Cesar Charles (1746-1823), the inven-

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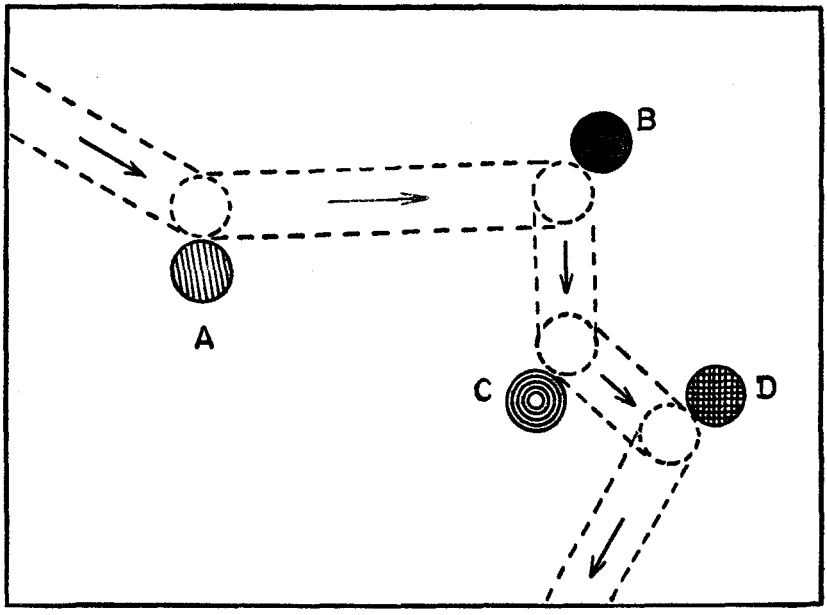

Fig. 4. The "mean free path".
The length of the path travelled between collisions is never the same twice running but it averages out to the theoretical mean free path.

tor of the hydrogen-filled balloon, had discovered in 1787 that gases shrank at a definite rate when cooled. For each degree centigrade of heat they lost, they also lost one 273 part of the volume. If this rule held true all the way, they should have no volume at all at a temperature of *minus* 273° centigrade. A long time later, in 1848, Lord Kelvin (born William Thompson, 1824-1907) went back to this discovery, suggesting that at *minus* 273° centigrade the gas might have lost all of its energy, not its volume, and that this temperature should be used as a starting point for a temperature scale that avoided the nuisance of "below zero" degrees.

From then on things moved fast. In 1857 the German physicist Rudolph Clausius (1822-1888) invented a new concept. A gas, he said, consists of "atoms" in steady motion, flying in all directions. Hence they must collide quite often. But while the distance between collisions would

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not be the same, there should be an average distance between collisions, that average distance depending on both density and temperature. This average distance is now known in English as the "mean free path". In 1860 the Scottish mathematician James Clark Maxwell (1831-1879) began to think about these problems. Maxwell felt that even for a given temperature the speed of the molecules would not be uniform. Some would move faster than the norm, and others more slowly; and it was only the *average* of these different velocities that corresponded to the temperature. Raise the temperature and you get a higher average molecular velocity, but a specific molecule might move at a rate corresponding to a temperature twenty degrees lower. While Maxwell, sitting in Cambridge, pursued these thoughts, Ludwig Boltzmann (1884-1906), professor at the University of Vienna, conceived the same idea. Consequently the kinetic theory of gases that emerged from their separate goosequills was later referred to as the Maxwell-Boltzmann theory.

The theory contained the explanation of Brownian motion.

We can't see the molecules as they move and collide, but if we have a body small enough to be kicked around by them, and large to be visible in the microscope, we see "Brownian motion". That it was first observed in water was an accident, but the explanation is the same.

But we still have not answered the earlier question how many gas molecules are there in a given volume. It was Joseph Loschmidt (1821-1895), also of the University of Vienna, who tackled the problem. Publication of his results took the form of a lecture delivered during the Twenty-Second Session of the Imperial Academy of Science in Vienna on October 12, 1865. The lecture had the somewhat surprising title: "On the Size of Air Molecules". Loschmidt explained that he used this term because the difference in weight of oxygen and nitrogen molecules is minor, so that they could be averaged to hypothetical air molecules. Now, he said, we are dealing with three values. One is the number of molecules per cubic centimeter—this we'll call N. Then we have the length of the mean free path, which we'll call L. And finally we have the diameter of the molecule which we'll call D. L. will be shorter as the values for N and for D become larger.

So far everything was quite clear. If the number of molecules per unit volume is larger, there will be more collisions. But

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there will also be more collisions if the molecules themselves are larger. Hence his main interest was in the size of the molecules; all else would follow from that.

Maxwell had calculated that the mean free path for a nitrogen molecule would be (at 15° centigrade) 1/447,000 inch, equivalent to 6/100,000 millimeters. (We now know that the value is around 9/100,000 millimeter.) Loschmidt thought that Maxwell's figure was a bit too small so he picked 14/100,000 which is too large.

So each moving molecule moves through a volume of space which is cylindrical with the length of the cylinder being *L*, or Maxwell's "corrected" figure, while the diameter of this cylinder is equal to the still unknown diameter *D* of the molecule.

Trying to determine *D*, Loschmidt assumed that the molecules in a liquefied gas touch each other. This was quite a simplification, and even if the molecules were strictly spherical and touched each other there would still be 26 per cent of the total volume that would be empty.

Just to complicate matters, it was still impossible to liquefy air at the time Loschmidt lectured. Hence he could not know the volume occupied by one gram of liquefied air. He assumed a value by comparison with those gases that could be liquefied in his day.

He concluded that the diameter of an air molecule was just slightly less, by three per cent, than one millionth of a millimeter. This, he said, was not a correct value but he felt sure that it was "neither ten times too large nor ten times to small." In that he was correct; his value was only three times too large.

Strangely enough he did not take the step to calculate the number of molecules in a cubic centimeter of air, but following his method that figure comes out as 1,800,000,000,000,000,000 per cubic centimeter. But Loschmidt had overestimated both the size of the molecule and the length of the mean free path; the true number of molecules per cubic centimeters is 15 times as large.

Usually this is called Avogadro's number. In order to honor Loschmidt for his pioneering effort the number of molecules *per mol* (the quantity of compound weighing as many grams as its molecular weight, or 32 grams in the case of oxygen) is called "Loschmidt's number", although he did not calculate it.

That writers, even of textbooks, sometimes call Loschmidt's number Avogadro's number is sad, but true. Just console yourself with the thought that "gas" means "chaos"! **WILLY LEY**

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THE ESKIMO INVASION

by HAYDEN HOWARD

Illustrated by GAUGHAN

Where they came from was far off in space. Where they were going was to rule the world of Mankind!

I

Snowblindness stalked him like a spectral white bear. Through his arctic sunglasses, Dr. Joe West's eyes winced. His forehead ached from the penetrating white glare.

Across the dazzling ice, shadow-shapes of children and squatty men romped on all fours. They were pretending to be bears, roaring and giggling as the bears devoured the children. Watching from their summer parkas with hoods turned back, the horde of swollen women exposed their squinting babies to the arctic sun.

It had been three days since the event, the birth.

For two days since Dr. West

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concluded these people could not be Eskimos, he had been trying to leave. *Escape* still seemed to be too strong a word to use.

"Today we go," Dr West said (asked).

"Soon-soon we go," Edwardluk agreed pleasantly; his was the only dog team in the encampment, only seven dogs and over a hundred Eskimos. "Soon as this person's leg is better."

"Your leg *is* better. Last sleep." Dr. West squinted down at his stethoscope, which dangled from Edwardluk's thick neck, "I gave you my heart-ears, and you said your leg felt better. You said we would go today."

"Eh-eh," Edwardluk laughed, politely agreeing with whatever the whiteman was saying, "leg is better than yesterday. Eh-eh, you are better. Each day you like us better. Tomorrow you like us better still."

"I like you now," Dr. West tried to restrain the irritation in his voice. "As soon as we travel to the whitemen, I'll tell them how much you helped me. As I've been telling you, the airplanes will drop much food for this camp. We must go!"

"Eh-eh," Edwardluk suddenly seemed to agree with enthusiasm. "Soon as we kill seals to feed dogs, we go!"

Edwardluk trotted toward his tent, and Dr. West followed with long strides, unable to believe this sudden activity.

"First we fill our bellies." Edwardluk flopped down on an ancient sealskin and shouted impressively for his wife to cut meat, of which there was little, although the Canadian Cultural Sanctuary Commission had re-stocked the Boothia District with twin-birth seals. "Then we sleep."

"But *now* is our chance to hunt seals," Dr. West protested, pointing with his recoilless rifle toward the shore-ice where a crack had opened, where seals could rise.

"Hunt seals," Edwardluk agreed like an echo and added helpfully: "Good dream protect us from bad ice. Good dream help you like us better tomorrow." With downcast eyes, Edwardluk smiled like a shy little boy and handed Dr. West a thawing glob of seal liver as if it were a Valentine. "Best piece for you."

Edwardluk's smiling eyes narrowed as his massive jaw crunched through the partially frozen meat. Gulping, he swallowed and crunched and gulped. His eyes closed with pure joy. His head sagged down. As easily as a tired child, he slept.

Dr. West's strong young hands

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tightened on his recoilless rifle. *These people are so obliging, so innocent, so damned lovable, it would be impossible to shoot. Damn! Damn, damn, damn!*

If I am a prisoner, he thought, *I can escape. I can escape whenever I chose to use — threaten to use force.*

Dr. West's contradictory grin, which also made him attractive to women who were more selective than Eskimo women, his uncertain grin cracked his chapped lips. *If I am a prisoner,* his thoughts echoed, *I can escape. If I am NOT a prisoner, by definition I cannot escape.*

Damn! That's a neurotic thought. I've got to escape.

He stared down at the scrap of meat which attracted flies to Edwardluk's small hand. These people lacked the gargantuan appetites of Eskimos. Also contrary to Eskimos, there were too many small children. More than the environment could support. The disproportionate number of children indicated a rapid increase in population. After 36 days with these people, Dr. West had written down too many observations. What he observed three nights ago was the absolute end.

If I don't leave now, I may never leave. Grinning, grimacing, he shook his head. *Damn! Got to escape.*

He glanced from the snoring Edwardluk to the sleeping dogs. Yesterday when he tried to order these people to help him prepare a sled, giggling they had diverted him from leaving. Marthalik had rubbed urgently against him, peeping up with sweet narrow eyes, urging him to come back into the tent ducking under his waving arms of anger. He felt trapped.

In her hood the wrinkled face of the baby had flopped back and forth, and begun to cry. From Dr. West's inexplicable rage, the people had averted their faces like hurt children, and his determination to use force, to seize a sled and a prisoner had dissolved in embarrassment, remorse, a dark tent and gentle whispering with Marthalik. Yesterday. Today.

In the white glare his eyelids itched. Dr. West knew if he was going to travel he should already have left. *These women, these incredibly wonderful women. I've got to escape now!* Simultaneously, he felt like laughing and crying.

Beyond the shore-ice and the dark crack, gleamed the veined sea-ice with distant islands glittering, icebergs. *God help me! I have to cross that!* He knew the Canadian Cultural Sanctuary Guard Post must be somewhere beyond that glowing horizon.

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Five years ago during his Alaskan Eskimo population survey Dr. West had learned how difficult it was for a Kabloona, a whiteman, to handle Eskimo dogs, but he had done it. *I can do it now if the dogs are harnessed to the sled.*

Flies buzzed above Edwardluk's sleeping smile, and his massive jaw moved. He was dreaming. These people, Marthalik, all of them, Dr. West had noticed how animated their faces were when they slept, as if their dreams were reality.

But reality to Dr. West was burning eyelids and the shock of the 33rd night. *Got to escape. Must outsmart Edwardluk.*

Quietly, Dr. West rolled up his sleeping bag. He slid his arm through the sling of his recoilless rifle, the only rifle in the encampment since the disappearance of Edwardluk's "brother", who had owned a rusty rifle and a rusty personality to match, and seemed more like a real Eskimo with his boasting and scratching. He had been troubled by lice.

But these people had no lice. These people had no tuberculosis. They were not Eskimos.

II

Dr. West hefted his pack. Heavy-laden he started the

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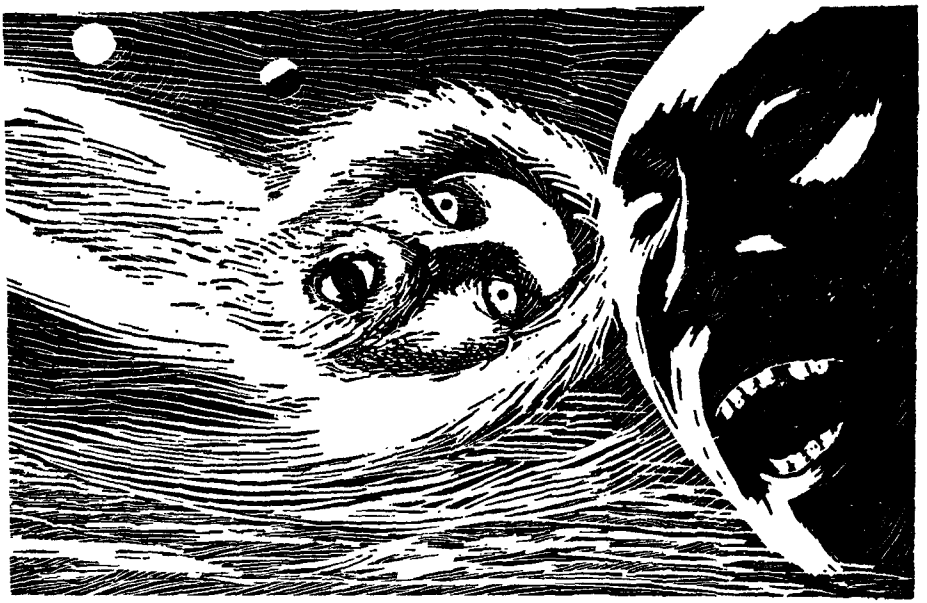

long walk across the ice toward the distant icebergs in the polar gulf. He hoped he was setting a trap for Edwardluk.

Dr. West's original intention had been to take one of these remarkable people back with him, and there was still that possibility, that possibility —

With each step, the silicone rubber membranes in Dr. West's boots exhaled fog. Yet he waded with dry feet through shimmering puddles of melt-water across the thawing sea-ice. Like a giant, he strode over eroding streambeds on the ice. Fresh water trickled toward dark leads where the sea surged, where seals could rise.

This summer ice was rotting, dangerous. He opened the vents in his outer parka because to perspire also was dangerous. "Bad, bad-bad," Edwardluk had said, "for whiteman to walk alone on sea-ice."

Then you come rescue me, Dr. West thought and walked on and on.

The icebergs seemed no closer, but when Dr. West looked back he saw that the encampment had miniaturized into a cluster of dots.

Like a midget, a midge, a dark speck, Dr. West plodded endlessly across the flat sea-ice. He hoped Edwardluk was watching, massive jaw beginning to sag with

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worry. Dr. West was gambling, possibly his life, that Edwardluk would grunt with decision, hitch the dogs to the sled and come out from that cluster of specks.

"Biggest 'skimo camp ever!" the nervous bush pilot had marveled when he set Dr. West down on the ice 36 days ago. "Where'd they all come from? Out you go, Dr. No-Name. Can't risk me license, even for all those plump little reasons waving to me out there. Got to take off." The expatriate Englishman's gaze had swept the vast arctic sky. "Cultural Sanctuary's patrol aircraft's likely airborne now, and hot after our vanished radar blip. Serious charges, landing on the Boothia Peninsula. Got to take off. Me aircraft's me life!"

The self-taught pilot, an ex-R.A.F. ground crewman, had not reappeared in two weeks as promised, or in three weeks, or in four weeks. Crashed, Dr. West suspected. If radar-tracked and arrested, the pilot would have blabbed by now, and a Cultural Sanctuary patrol plane would have swooped low, searching for Dr. West.

Dr. West's application for a Landing Permit had been denied by the Cultural Sanctuary Commission in Ottowa. Not even Overflight Permits were being granted anywhere near the North Magnetic Pole. Dr. West suspected that politics or professional jealousy was behind the refusal. Perhaps the ethnological bigwigs at McGill University wanted first look at the rumored population increase but hadn't got around to it yet. Surely they didn't think Dr. Joseph West, former Director of Oriental Population Problems Research at the University of California, now unemployed, had become a smuggler of transistor radios and steel tools which could culturally dislocate the Boothia Eskimos. There was little evidence of recent cultural smuggling to these people.

Dr. West shook his head. If what he had observed continued, these people were more apt to dislocate the world than vice-versa.

His pack-straps sawed into his shoulders. His feet plodded on and on across the sea-ice. He squinted at the sky, although he had given up all hope of being arrested, rescued by a Cultural Sanctuary aircraft. The only way of carrying his warning message to the Outside seemed to be through hopeful physical exertion, plus guile if Edwardluk fell into his trap.

Above the peak of the iceberg, a flock of dark fulmars whirled. Around the berg gleam-

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ed broken ice and dark water where sea birds could feed. Dr. West was surprised that he did not sight a single seal as he circled behind the berg.

Now he was out of view from the camp. Dr. West hoped Edwardluk was harnessing the dogs. *If his friendship talk was genuine, he'll come to rescue me. If not, he'll come to recapture me.* But there was a third possibility, unfortunately. Edwardluk might simply go to sleep — because he didn't give a damn.

From his pack, Dr. West took out a pad of caribou skin and sat down. Rifle propped against his thigh, he waited. The trap was set for Edwardluk. And waited.

Cold rose through the ancient caribou skin pad into Joe West's haunches. Restlessly, he remembered his Alaskan Eskimos had used bear skin pads because they were thicker. But these Boothia people owned no polar bear skins. They said they never killed their father-bear, and Dr. West was inclined to believe them.

The cold enfolded him. From the corner of his eye a small part of the white background trotted across his field of vision. It was an arctic fox, plume-tailed and oblivious.

Suddenly the white fox stared at him or past him. Dr. West felt a creeping urge to look behind his own back. He remembered that the Eskimos refer to the white fox as the bear's dog. On the sea-ice, the fox follows the polar bear, dependent on the bear's kills. The Eskimos say: "Fox on ice, look behind you quick, is bear."

Turning his head Dr. West squinted at each white mound and fuzzy shadow. At point blank range, he knew a polar bear would appear more cream-colored than the ice. A black spot would be the nose of the polar bear. The Eskimos say: "Bear hold white paw over nose, bear gone, eh-eh. Bear still there."

"Ha!" Dr. West shouted, standing up. The immense white background remained immobile. From the white mounds, a polar bear's head did not rise weasel-like on its long neck.

"Spooked myself. These people talk too much about bears." Dr. West twisted his chilled face in another grin. He didn't want to remember Edwardluk's wide-eyed face above the seal oil lamp.

Like Eskimos, these people entertained themselves with night stories. Thick neck tilting from side to side, his eyes closing in ecstasy, Edwardluk had grunted like a bear. "Grandfather of the sky!" Edwardluk's suddenly hoarse voice had creaked.

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"Sharpen your hunger. We — your children — prepare for you. Open your jaws!"

Dr. West blinked his eyes and shivered. If their grandfather was a bear-spirit, that was all right with Dr. West. Who was he to deride anyone's totems or religious beliefs? But after 36 days, what grated his nerves was the continuously nonanthropomorphic theology of their night stories. These people had things backward, he thought.

The mythology of other Eskimos, real Eskimos, presented bear-spirits as merely helping or hindering man. Man was the end-purpose.

But in these people's stories the bear seemed the end-purpose. The People helped the bear. The People prepared the seals, the rocks, the airplanes, for the bear. This was not the bear on the ice. This was a bear in the sky. The purpose of all life seemed to funnel into the bear.

What their bear symbolized, Dr. West had not found out, but he had had enough experience with real bears to suspect that a hungry polar bear makes little distinction between a prone man and a seal. He remained standing, clutching his rifle. The non-appearance of seals in the open water around this iceberg suggested that a real bear was near.

Dr. West's eyes watered with the strain of trying to see everything and distinguishing less and less in the white glow of the ice. The cold soaked up through his feet His leg bones became conductors of the cold. Sometimes he stood motionless, forgetting to stamp his feet. His vision and time blurred.

The fulmars cried out in alarm and whirled dark wings upward into the sky, and Dr. West's eyes widened. He turned. He laughed with relief. A line of black specks across the ice became dogs pulling a distant sled.

Dr. West sat down on his caribou skin pad, but his heart was thudding with suppressed excitement, and he stood up. Peering, suddenly he cursed.

There was more than one man approaching. A man trotted ahead of the sled. The dark bulge on the sled was a second man, probably Edwardluk. Far behind, a third man plodded over the ice.

Three men were more than Dr. West had bargained for, even though he had the only gun.

By the time they were close Dr. West still had not decided what to do.

"He was watching you!" Edwardluk shouted happily. "Up there he was watching you."

Dr. West stared up at the peak

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of the iceberg. If Edwardluk was referring to an actual bear, it was invisible to Dr. West. He squinted at the dogs, who lay down; they had not scented a bear.

"Seen us coming." Edwardluk made a circling motion with his wide face and stubby nose, and Dr. West supposed the bear had circled out of sight behind the berg.

"We come to carry back your seals," Edwardluk said innocently.

The second man stood smiling at the sky. The third man still was approaching. They seemed unarmed. In their fur parkas they reminded Dr. West of three childhood teddy-bears. They had been kind and hospitable to Dr. West, and now he couldn't quite bring himself to point the rifle. He didn't want to threaten them with harsh words which would bring hurt expressions to their child-like faces. He didn't want to kidnap a prisoner.

Swiftly he rationalized that it might be dangerous to take a prisoner. The prisoner might chew through his bonds while Dr. West slept. *Let some anonymous expedition seize the first laboratory specimen.*

"There is a dead seal under the edge of the ice," Dr. West blurted, pointing with his rifle barrel and walking behind their backs to the sled. Their harpoons still were lashed to the sled.

"Eh-eh," Edwardluk's voice agreed politely to the lie. "There is a seal but my eyes don't see it yet."

Dr. West's shivering hands were tying his pack and sleeping bag on the sled.

"Ha!" Dr. West shouted at the dogs as he flopped on the sled, and to his surprise and relief the dogs lurched forward before he could use the whip. They dashed past the startled face of the third man. Back to camp was where the dogs were hurrying. Slashing the whip with all his strength, Dr. West manged to turn the leader toward the ice horizon.

The sled passed in an arc through the shouting range of the running men, but Dr. West managed to whip the dogs away, the sled weaving a snakelike course beyond the iceberg with Edwardluk running far behind.

I have escaped, Dr. West thought inaccurately.

The terrible global significance of what he had observed about these people he had not fully analyzed. Mainly he was fleeing from what happened on the 33rd night, and from his contradictory desire to go back to them. To the women —

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He clung to the sled undulating over the ice. The wonder of the 33rd night. The dogs were running uncontrollably. The shock of the 33rd night. The sled bounced over a pressure ridge. The women —

If he let go he would fall off the sled and go back. He laughed with bewilderment. It was these women who would be too much for the world.

Dr. West's only intimate experience with women had been limited to a high school girl a year older than he but equally flustered, several indistinct sorority girls who might have been the same girl several times, four or five student nurses when he was in Med school, including one he vividly remembered plump and unadorned in unexpected glory, six or seven lab technicians, the last leaving him unbearably guilty and resolving to give up sex, followed by a tired old waitress in Cambridge, Mass., a dozen sprightly R.N.'s and doctor-chasers, the hospital administrator's fiancee who laughed when he asked her to take him seriously, followed by a tired old cocktail waitress in Berkeley, California, paralleling the story of his life, earnest female graduate students at U.C. in Public Health, Anthropology and Genetics, a gorgeous Ph.D. in Population Statistics who for unstatistical reasons decided against marriage, followed by his population research expedition to the Alaskan tundra and a giggling Eskimo woman of whom the only thing memorable was her aroma, the same gorgeous Ph.D., telling him that his theory of Arctic Human Ecology should be recognized beyond the scientific community and he should become more *assertive*, which he was to an arch-eyebrowed interviewer from *McCall's Magazine* and a round-eyed interviewer from *Good Housekeeping* who kept calling him a boy-wonder, and the same gorgeous Ph.D. congratulating him in the nicest way that she could for his appointment as the Director of Oriental Populations Problems Research at the University of California, a period of overwork, the same gorgeous Ph.D. commiserating him for being unexpectedly ousted as Director by that determiner of all large research grants, the Secretary of Defense, followed by a tired old barmaid in Moosejaw Saskatchwan and an unscheduled airline stewardess in Coppermine, Northwest Territories, five hundred forbidden air miles from the Boothia Peninsula.

These remarkable women on the Boothia Peninsula were so much more — *I'm crazy to be leaving,* he thought.

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He clung to the bounding sled, trying to blank out the 33rd night and his incredible first experience with Marthalik.

The sled runner jammed in broken ice. The sled almost capsized as it abruptly stopped. His sunglasses slid down his nose.

Blinking, Dr. West slid off the sled, hoisted the runner free and shouted at the dogs, who surged forward. Dr. West found himself loping behind the sled, trying to overtake it, running. He fell, dislodging his glasses as he lunged through the blinding white glare, almost seizing the sled, skidding across a puddle of melt-water. Springing up, running hard and shouting angrily at the dogs, he had thought they would stop, but they were veering off to the left, and their loose gait accelerated to an excited rush as if they had scented a seal.

His commanding shouts grew shrill. Desperately he ran a shorter course to head them off, but they were bounding too fast, the lightened sled skipping behind them. Without the sled he was helpless, hopeless. His eyesight whirled with blinding lights. He tripped.

Kneeling upward, gasping with breathless panic, he unslung his rifle. In the glare, his twitching eye could barely distinguish the front sight as it shook back and forth. Aiming ahead of the dogs he fired.

Unchecked, the dogs ran into the blinding distance. He fired and fired. A dog turned end for end, biting its rump as the other dogs dragged it along. A dog in front of the sled yelped and was mounted by the sled-runners as the team swept on. Dragging two writhing dogs and the swerving sled, the dog team charged on like troops into battle.

The leader abruptly stopped as he reached an open lead and the sled skidded sideways braked only by the bodies of the two wounded dogs from sliding into the dark water and engulfing them all.

The dog team stood looking back at Dr. West, their breath fogging. If there had been a seal, it was long gone.

Kabloona, you panicked. Dr. West blundered toward the team's watching eyes and steaming grins.

His unprotected eyes were shimmering and blurring but he had to recapture the sled before he could go back to search for his dark glasses.

One dog lay limply entangled with the sled. The other whined and sniffed its shattered spine.

The sled dogs watched, their

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tongues lolling out of great grins, while he pointed the rifle muzzle at the wounded dog's ear, closed his eyes and pulled the trigger.

His hand trembling, Dr. West cut through the leather traces and freed both dogs. Squinting against the whiteness, he tried to see back along the sled runners' trail all the way to the indistinct pressure ridge where he thought he had fallen, where he had lost his glasses.

He was afraid Edwardluk and the other two would have heard the shots, but they should be a long way off near the iceberg. Surely that was a different iceberg. His eyes were killing him!

To reduce the glare, he slit his handkerchief and tied it across his eyes. Almost blinded, he shouted at the dogs, pushed the sled, yelled, cursed, flailed with the whip while dogs dodged in every direction, and suddenly the dog team darted, curved and flowed along their back-trail toward the pressure ridge. He intended to allow himself one minute to search for his sunglasses.

"Kabloona, here are your snow eyes!" Edwardluk stood, holding the dark glasses above his head.

Dr. West tore off the handkerchief, but did not see the other two men in ambush.

"Hand me the glasses." Dr. West did not point the rifle directly at Edwardluk.

Edwardluk's small hand extended the sunglasses. "Bad dogs run away," his voice murmured, and he ducked his head as if ashamed. He shuffled his mukluks on the ice. "This poor person couldn't run fast enough permit this poor person to—"

"I cannot return to camp," Dr. West interrupted. "I must go find the other whitemen now."

"The other whitemen," Edwardluk agreed like an echo, and his real thinking emerged circuitously. "Bad ice. Two dogs no more. We like you. We help you always. When ice is safe, we go. Tomorrow. Each day you will like us better."

Dr. West became aware of movement behind him, talked fast. "I cannot go back. I'll help you. I'll tell the whitemen your babies are hungry. I'll send food. Because I like you," he insisted. rapidly. "I like you. Great bear eat me if I lie."

Edwardluk looked up, and his shy smile widened. "Eh-eh, you want to go, we go! Someday we People help the whitemen. When we are many, help much. Help whitemen of whole world." Like a tiny giant, Edwardluk spread his arms and laughed, unaware that the world is 24,000 miles in circumference at the Equator, that there are six billion white-whitemen, yellow-whitemen and black-whitemen, that their vast

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machines rumble and lurch toward the stars.

"Ha!" Edwardluk shouted at the dogs and cracked the whip. The sled rushed off carrying Dr. West, and Edwardluk, running alongside, shouted: "There is the mountain."

"Which direction is the Post?" Dr. West meant the Cultural Sanctuary Guard Post, whose radar the bush pilot had tried to avoid.

"Eh-eh, my brother has been there, and this person's eyes turned inward see. On a line past the mountain past the island three—four sleeps. The whitemen will see this person helping you."

IV

The dogs soon tired, and Dr. West trotted beside the sled toward the gleaming horizon.

Slipping, tiring, he jammed the muzzle of his rifle into the ice as he fell and rose muttering, staggering after the relentlessly glidding sled. He was encased in perspiration as he slogged into the blinding sun.

The idea came to him in his exhaustion. If Edwardluk's plan was to wear him out and then seize the rifle—

When the sled snagged on a pressure ridge, Dr. West lay on the sled. The dogs lay down.

"Eh-eh!" Edwardluk scampered about with seemingly inexhaustible energy trying to sight a seal, forcing two of the harpoon shafts into the ice, erecting a tattered caribou skin windbreak. "Eh-eh, you rest in camp. This person talk to seal, eh-eh." He hefted the last harpoon. He walked into the distance.

The wind hissed over the ice, bending the caribou skins into a funnel, a wind-funnel directed at Dr. West's congealing body. Edwardluk had vanished. Shivering, Dr. West ceased to know he was shivering until his ears awoke him to the distant grunting of the polar bear.

"Eh-eh," Edwardluk's voice laughed. "He don't find no seals either."

The dogs' voices whined, but their tone was not hunger. Dr. West's eyelids seemed glued together. The dog's voices whined with fear. Alaskan Eskimo dogs would have been roaring with eagerness to rush along the scent of the polar bear, he thought. These dogs were whining.

Dr. West slid his fingers under his sunglasses to his throbbing eyelids. Overpowering light penetrated although his eyes were closed. His head ached with pain messages from his overloaded optic nerves. When he tried to open his eyes, he gasped, drowned in dazzling liquid light.

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He was snowblind.

The distant bear emitted a hoarse cough. Dr. West's hand tightened on his rifle. When a bear is hungry enough, he thought, it will stalk sled dogs lying on the ice like seals. When a bear is starving it sees nothing but seals, and I am blind.

"Eh-eh," Edwardluk's voice laughed, "nothing but seals. Give me the rifle. Big noise will tell bear we are not seals."

"I will hold the rifle," Dr. West replied; he was afraid the rifle was all he had, snowblind and helpless. "I know how to work it."

"This person knows how to work it," Edwardluk volunteered, and Dr. West could hear him moving closer. "My brother had one and he shot it all the time."

But not at bears, Dr. West thought.

"At bears," Edwardluk's voice persisted. "My brother shot a bear and that is why he vanished. It was bad for him to kill a bear." Prior to this Edwardluk's story had been that his brother had vanished while travelling to get more presents from the whitemen of the big whale-kayak, the whitemen with beautiful red stars on their caps.

"You would not shoot the bear even if I gave you the rifle," Dr. West replied, clinging to the rifle.

"Eh-eh," agreed Edwardluk, this person is not a bear-killer like my brother. This person would only shoot a loud noise so the bear hears we are not seals." He shuffled away.

Dr. West clicked off the safety-catch. The recoilless rifle boomed, kicking viciously. There had been ice in the barrel, but it had not burst. "I have frightened the bear." Now there was no need for Edwardluk to have the rifle.

"If this person had the rifle, a seal could be shot." Edwardluk's voice moved closer.

"There are three harpoons", Dr. West replied.

"But your eyes are bad," Edwardluk began circuitously.

"I will not give you the rifle."

Further away the polar bear made a strange mooing noise.

"This person watched you while you sleep," Edwardluk said, as if this was more important than the circling bear. "Eh-eh, asleep you frown, you twist. In the emcampment it was this way also. You look unhappy when asleep. My brother was that way. Even with arms around woman, your sleep-face is unhappy. Are all whitemen unhappy when they sleep?"

"How the hell should I know?" Dr. West slung his rifle over his back and crawled blindly on to the sled. "Let's go!"

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"Whitemen do not shoot the People?" Edwardluk asked. "As if we are dogs?"

"No, I was frightened when I shot the dogs. I thought they were running away. I thought they were leaving me alone to die. I only shoot things that are leaving me to die."

Joe West clung on the dragging sled, his head muffled in a darkness of caribou skin, his eyes throbbing and flashing lights of pain. Once he heard Edwardluk shouting to someone, and his stomach contracted. He dreamed Edwardluk had circled back to the encampment. No escape. Then he realized Edwardluk had merely admonished the dogs.

The sled was moving sporadically as if the dogs were exhausted.

Motionless, Dr. West was awakened by the distant crack-whoosh of a recoilless rifle. Whitemen? Dr. West's fingers clawed along the oddly thin stock of his rifle. He was holding on to a harpoon shaft. "My rifle. He's stolen my rifle."

The dogs whined, hungrily straining, but the sled creaked immovably because Edwardluk had anchored it to the ice so that the dogs could not rush forward at the sound of the shot, which meant seal-meat.

Edwardluk's plodding return and a dragging sound were overwhelmed by the roaring lunges of the dogs. Edwardluk was feeding the dogs first, hurling thuds of meat within their harnessed range. Then he was beating them off. "No more! Got no more!"

"Here is the warm liver." Edwardluk must have carried it under his parka. "Eat. This person left a little blubber by the water for the bear. Eat. The great bear will see how we helped the bear. Eat. Soon this person shoots a bigger seal. You eat. Where we are, many wide cracks and soon another seal. Then this person will eat."

From the distance rose a long-drawn howling roar like a giant, insane.

"My God! Was that the bear?"

"This person don't know. The bear, it was the bear. A little taste of blubber wake up bear's stomach. Eh, eh," Edwardluk laughed nervously. "Bear want to eat world."

"Give me my rifle," Dr. West demanded angrily.

"Eh-eh, he is only a bear." Edwardluk clicked the rifle's safety on or off; there was no way for Dr. West's ears to tell which. Edwardluk's voice diminished as he moved away. "Bear don't like man's smell. Once my brother's rifle don't work, and he lie still and bear sniff him and go away."

The snarling was the dogs.

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"What are you doing?" Dr. West meant: don't leave me alone.

"—to shoot another seal. Dogs not fed enough to sleep, only enough to fight each other. This person must look for another seal." Edwardluk added with practicality: "Your smell will keep the bear away from dogs. Before very long this person come back."

Dr. West groped on the sled for the harpoon shaft, clutching it.

"Best thing is sleep," Edwardluk's voice said, softer, but closer. Instead of leaving, Edwardluk squatted down so close Dr. West could feel his radiated warmth next to him and could hear his excited breathing.

"The important thing, will the whitemen like us?" Edwardluk blurted. "We don't harm anybody. We helped you. We want to help everybody because—we know. You frown, you twist when you sleep. But we sleep happy all with same dream because we are here, we are there, we know why."

Edwardluk's voice hoarsened with emotion, with joy, and his hand gently closed on Dr. West's wrist. The great bear will come down when there are enough of us and—"

Dr. West had stiffened involuntarily, and Edwardluk stopped, as if sensing rejection. Again, Dr. West knew what Edwardluk was thinking: you don't like us. For 33 days Dr. West had been bombarded by the love and mythology of these people. They wanted — needed — to be liked.

If these people were not caged in this Cultural Sanctuary, Dr. West wondered, would they be scurrying door to door, knocking and disturbing housewives with their joyful apocalyptic message?

"He will come," Edwardluk's voice insisted, "when we have covered the world for him!" Edwardluk's grip tightened on Dr. West's wrist. "Our bodies will reward him for our birth." Edwardluk's voice rose in confidence and joy. "His great hunger is for us, for us. To this world and all worlds, he comes."

Edwardluk released his grip, standing up. His foot-steps shuffled away over the ice. The dogs whined with hunger and hope of seal meat.

Through the wind drifted the distant grunting of the bear, and the wind hissed across the sled. Under the icy caribou skins, Dr. West lay shivering. Eskimos say real life, dream life, begins while sleeping cold, dreaming cold, awakened into sleep like a wolf inhaling the scents, like a caribou hearing the most distant sounds, like a hand feeling . . . .

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V

During the 3rd night he had camped with these people in an overcrowded tent where their stench congealed in leaden cold; his only desire had been for sleep. He pushed away the smoothly bare arm. Tired and still apprehensive of venereal disease and lice, he did not want any anonymous and greasy Eskimo girl. "Eh-eh," her faceless voice giggled. "Marthalik."

"Go away. I want sleep." But with warming excitement he discovered he was becoming—he had become a lover of an intensity he had never experienced. His mounting ego said: Superman, you're getting out of it what you put into it. But he overpraised himself. Smooth-bellied and moving indescribably, Marthalik was the lover, he discovered. Marthalik.

In Marthalik's arms he dreamed the bear was approaching.

He laughed in his sleep. Unique. Marthalik might have become his Cleopatra, his Goddess Calypso who imprisoned Ulysses in her island bed. He might have become an odd wanderer with an Eskimo wife. But when he went out to help search for Edwardluk's "brother", Marthalik had not accompanied him. She was not feeling well. Thinking of her warmth, he had trudged away with a dozen Eskimos.

Camped in the lee of a cliff, Edwardluk had persisted in offering his sister or his wife; Dr. West was too sleepy to recognize which. Worn by Edwardluk's generosity, anxious not to hurt anyone's feelings, Dr. West said: "Oh, hell," and embraced her. Wonderful surprise! She was as wonderful as Marthalik. They all were. This went on and on. These wonderful women could conquer the world. He laughed in his sleep.

Even on the 23rd day, when he noticed that Marthalik, his first slender girl of the 3rd night, now appeared slightly thick-waisted and heavy-gaited, he could not forsee the reason the age-population curve in this encampment was skewed so drastically to children and babies.

During the 33rd night a girl gave birth to a son. Dr. West tried to believe he confused one girl with another. They all looked so much alike. This girl could not be Marthalik. Holding her mewing baby under her chin smiling proudly, she reassured him. "Eh, this person is Marthalik."

Her baby appeared to be typical Eskimo baby fathered by an Eskimo. There was a typical mongoloid blue spot near the base of the spine. Even Eskimo

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babies are born with blue eyes. He kept telling himself he could not be the father. Marthalik could not be the mother. This was a full term baby, which should take approximately nine months. A thirty-day gestation period should be impossible for a human being. It would be catastrophic for humans enmasse.

These people cannot be Eskimos. What are they?

Shivering into wakefulness, awakened by whining dogs, Dr. West sat up on the anchored sled. The grunting sound, like an approaching hog, was the polar bear.

With his finger and thumb,

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Dr. West peeled one eyelid open and gasped with pain, stabbed by the blinding white light. His eyes flooded with tears. Along the sled he groped for the two harpoons.

"Edwardluk!" he shouted, and the vast emptiness of sea-ice swallowed his voice and returned like a false echo the grunting of the bear.

His hand gripped the harpoon shaft. Best weapon for a blind-man? To his own surprise he laughed. A bit shrilly, but he laughed. Turning his head to follow the pig-like noises of the bear, he extended the harpoon. "Come on you invisible spook! I'm a man, not a seal."

His pounding heart, his surging andrenilin, had given him back his warmth, his liveness. He laughed with surprise that he was not afraid.

Much closer than before, the bear growled.

The dogs yelped, violently thrashing the anchored sled, concealing any sounds of the bear.

In this uncertain moment Dr. West re-evaluated. These doge were straining to escape. Escape was simple!

His atavistic flow of courage froze. With the hurried gasps of a civilized man, Dr. West dropped the harpoon and unsheathed his short-bladed skinning knife.

Of course the dogs would run, he thought. They would drag the sled away, carrying him.

The bear growled.

Tight-muscled with fright, Dr. West lurched across the straining sled, fumbled back along the rail until his hand found the taut anchor strap. His knife slashed.

The strap broke, the lunging dogs yanking the sled from under him. He fell on his elbow on the ice, momentarily stunned by his stupidity as the clamor of the fleeing dog team faded into the distance.

He couldn't escape, he thought. Was he predestined to—?

"Edwardluk!" Dr. West started

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to rise, and was warned by a cavernous growl.

He remained in a crouching posture, turning his head in the direction from which the sound had emerged. He was facing upwind, and an odor of rotten meat became noticeable, but now he couldn't hear the bear. The bear must be motionless, staring at him.

Gradually, Dr. West sank down on the ice, his knife hand under his shoulder as he flattened out on the ice, his vulnerable stomach pressed against the ice, his legs pressed together, his shoulders hunched protectively about his neck. His chest pressed against the ice, his heart thudding against the ice. He could hear the hiss-hiss of its breathing, the bear's shuffling advance.

Dr. West made no new attempts to open his eyes. He tried to see backward into his concrete-block cottage in California. It became a sunlit fortress. Behind the locked door, behind the multi-colored dusty books on the top shelf lay his .44 magnum Ruger Blackhawk revolver, heavy hog-leg single-action revolver, gleaming thick cylinder stuffed with six bullets looking fat as thumbs, packed with explosive—emptiness.

The bear snorted. Motionless on the ice, Dr. West suppressed his breathing. He remembered Alaskan Eskimo hunters laughing how they had behaved in such situations. Prostrate before their bears, they had lived to joke. "Don't breathe," Eskimos say. "Bear never kills dead man."

The polar bear's stench engulfed him. Above him poised the hiss-hiss of its breathing. There was a gurgling sound, the ravenous contractions of its digestive system.

As forcibly as the blunt end of a baseball bat, the polar bear nosed his thigh, trying to turn him over.

Desperately, he wanted to lunge away but lay in fear the bear's quick paw would smash him like a seal if he moved.

He wanted to leap away with a nightmare shriek as the bear's nose clubbed his thigh, his hip, shoving to turn him over, to expose his vital belly. Resisting, Dr. West tried to sag against the ice, to keep his belly down.

With an eager grunt and a series of hisses, the bear's nose burrowed under him, pushing up his hip. He twisted, was clamped—

The shriek and muscular spasm ballooned to his consciousness. His thigh, the bear's jaws! With the squawling vitality of any animal being devoured alive, the former Dr. West writhed, striking the knife blade across the hard muzzle of the polar bear.

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With a startled woof, the bear's jaws opened. Dr. West's body rolled away slashing the air and screaming defiance like a cornered animal. Backing away, gasping, he hacked the air with the knife while the shuffling sounds of the bear departed.

He became aware of the throbbing of his thigh. Gummed eyelids torn open, he faced blindly into the whiteness and listened through his own harsh breathing for the silent bear, and remembered who he was.

Dr. West's fingers explored the slippery twitching remnants of his thigh muscle. Hard-jawed, he tourniqueted his belt around his thigh and gasped.

"Edwardluk," he gurgled. "Edwardluk, Edwardluk!" he yelled.

There was no Edwardluk. "Edwardluk! Edwardluk!"

His voice thickened. His head seemed to sail away, and he muttered and twisted, resisting. If he fell into shock, he thought, in this cold he would be dead.

Dead, dead, irretrievably dead. All gone. Finished. Nothing.

From hissing wind emerged a scraping sound approaching. Edwardluk's voice wheezed, "Dogs turn away from water too late. Sled float. Curlytail drown. Loafer drown." All Edwardluk could talk about was the dogs. "Hump drown. Wind Runner drown." Edwardluk slid darkness and warmth down over Dr. West's head and shoulders; Edwardluk was giving him his outer parka. "White Eye drown."

Edwardluk was prodding his leg, wrapping his leg in something jelly-like within wet fur. "Fished out dogs. Cut up. Eh-eh," Edwardluk laughed feebly, "much good dog meat for everyone. This person cut open Wind Runner and White Eye for bear."

With crunching sounds, Edwardluk was breaking apart the sled, rebuilding it into a tiny man-sled. Gently, Edwardluk's hands tied Dr. West on the sled.

Blind, Dr. West knew they were microscopic specks in the enormity of sea-ice, shore-ice and ice-shaped mountain-islands.

"We go!" With a grunt, Edwardluk strained at the harness, and the jolting hours moved through chills and sleep and fever, becoming days of blind agony without end.

Edwardluk's soft voice tried to soothe. "Eat-eat." He was pressing chewed dog meat into Dr. West's mouth.

Edwardluk would shout: "Ha! Forward, dogs!" and Edwardluk's stubby legs would tramp forward, endlessly dragging the man-sled with its raving burden, Dr. West.

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"The bear," Dr. West would gasp. "Got to warn them." The Canadian Cultural Sanctuary Commission became twelve pairs of eyes surrealistically floating in a jury box. "Please believe me." *The population pressure among nations, in the amoeba-like growing struggles of the population masses of the world, these multiplying Eskimos will be the Bomb for whatever nation makes use of these.* "Believe me, they're not Eskimos."

In his delirium, Marthalik's face rose smiling. He clung to her body. The droning of the airplane transformed snowflakes into parachutes drifting down with swaying food packages. As absurdly as Pop Art, these were paint-labeled FAMILY ALLOWANCES, swaying back and forth. Massive jaws crunching.

"Too many Eskimos." For these happy people what did the bear symbolize? "Don't feed the bear!" he shrieked.

The giggling Eskimo women were stuffing ovulation suppressant pills into their ears. Their bellies inflated. The Earth tipped. From the darkness of space opened the jaws. "The bear!" he shrieked.

In more lucid moments, Dr. West clutched his swollen thigh and thought what a good man Edwardluk was. Laughing, straining, uncomplaining, that was the Eskimo image. They were cheerful people who fought no wars. It was true. So true. Men of goodwill all over the world would not let the Eskimos starve no matter how many Eskimos . . .

VI

The headwind carried the smell of fuel oil smoke, the barking of dogs.

"Carry the poor bloke into the storehouse where it's dark. I'll take the rag off 'is blinkers. Coo! Eyes like bloody sores!" The man's voice was the perpetual employee, Dr. West thought dazedly, another Englishman imported to Canada in the population struggle.

The French-speaking Canadians were outbreeding the rest two to one, gaining numerical control in spite of English immigration. French Separatists no longer spoke of separations but of French as the required language in all of Canada's schools. Dr. West's eyes throbbed like hammer blows into his skull. His snowblind eyes —

"Kerosene eye drops I always says," the ex-Londoner's voice was croaking. " 'Ere comes the Commissioner. Kerosene eye drops for snowblindness."

"No, wait!" Dr. West gasped. "Leave my eyes alone. I'm a doctor. I need special treatment.

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I must be flown to a hospital with—with Edwardluk."

"If you're a doctor, where's your kit?" the Cultural Sanctuary Commissioner's voice accused. "You're another cultural smuggler. You smuggling bastards won't leave the world's best people alone, not for a minute! You're the third smuggler I've caught in my district this year."

"No steel fishhooks, no transistor batteries on 'im," the ex-Londoner protested. "Coo! Commissioner, look at 'is leg!"

The Commissioner evidently bent over Dr. West's leg because there was a retching sound.

"Gangrene."

"Dog bite him," Edwardluk's voice volunteered. "Bad leg. This person drag him on little sled—that many sleeps." Edwardluk must be holding up stubby fingers, feigning ignorance of counting. "Dogs drown. This person drag him all way from Mountain Bay."

"Thom Bay? That's an extremely difficult and hazardous —my man, you've completed an epic journey!" The Commissioner panted with pleasure. "You're a hero."

He must be shaking Edwardluk's hand, and Edwardluk giggled with embarrassment. "Pulled whitemen long way. People hungry. He say much food here."

"No one will starve," the Commissioner said warmly. "Emergency Family Allowances will be authorized. Survival always is more important than 100% self-sufficiency. If necessary we'll even paradrop a Family Allowance for every Family Head on the Boothia District Roster!"

"Eh-eh??" Edwardluk's voice laughed in confusion. "Will you help us? Many-many people hungry!" Edwardluk must be spreading his stubby arms. "Many people. Here his marker-book."

"I'll be damned!" From the sounds, the Commissioner must be thumbing through Dr. West's notebook.

"He count people. Say not enough seals." Edwardluk expounded. "He count babies. Say more hungry quick."

"We'll make our own population survey. This man evidently is deranged. He appears to be dying."

"We help whiteman. He say all whitemen will like us because we help him." Earnestly, Edwardluk must be pressing his hand on his chest. "This poor person carry whiteman all this way. Pull sled like dog," Edwardluk laughed nervously.

"You're a better man than the whitemen!" The Commissioner

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was bubbling with enthusiasm for his Eskimos. "You've made an epic journey; there will be food for everyone. Boothia District will gain proper notice if you will speak thus on the C.B.C. The telly, the picture box. "Tell them of the hunger."

"People hungry," Edwardluk repeated wistfully enough to melt the hearts of any T.V. audience. "Babies hungry."

Dr. West gritted his teeth. There was no use attempting to speak now. The Commissioner would not listen because he was in no mood for an "attack" against the Eskimos. Later—

This Commissioner emotionally would reject unpleasant facts. Finally when the Canadian Cultural Sanctuary Commissioners' noses were rubbed in the evidence, in the sinister implications of a one-month gestation period, both the Commission and the Canadian Government would temporize. Dr. West thought.

"Forcible birth control?

Surely not in a free nation! No matter what you say, they're as human as I am," this Commissioner would protest. "What would you wish us to do, let these good, happy, cooperative people starve? The real moral issue becomes GENOCIDE!" Dr. West's thoughts had a dream-like reality.

"Coo! Is he dying?" said a voice which penetrated Dr. West's delirium.

And Eskimos have Asian identifications. Dr. West dreamed the U. N. General Assembly with outraged shouts and dark faces rising against a rumor that Canada was planning "Eskimo family limitation." "Sterilization!" "Imperialist suppression!" To aid the starving and disadvantaged Eskimos, the Chinese Federation of Nations would offer Cultural Assistance. Roaring airplanes from Asia, from Europe, from embarrassed America would parachute food throughout the spreading Arctic while the people multiplied and multiplied.

"Eh-eh, we fill world," Edwardluk had explained weeks ago with lovable simplicity, "until bear comes."

Death gnawed Dr. West's leg, and he tried to sit up while Edwardluk's gentle hands held him down.

"Must speak," Dr. West gasped, thinking: *I must live.* "I must speak."

"You sleep now," Edwardluk was whispering, holding him down. "He come."

In his delirium, Dr. West could hear the galactic runting of the bear. —HAYDEN HOWARD

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(NON-FACT ARTICLE)

Galactic Consumer Report No. 2: Automatic Twin-Tube Wishing Machine

by JOHN BRUNNER

Don't waste your credits! Consult this handy buying guide before you purchase — or you may pay dearly!

Extract from GOOD BUY, published by ConGalFedConAss, issue dated July 2329 ESY

AUTOMATIC TWIN-TUBE WISHING MACHINES

(Note: this forms part of our series of reports on products not yet in very general demand, but representing a substantial investment of credit — cf. our recent tests of inexpensive time machines.)

Introduction

We have received many letters asking what we think of twin-tube wishing machines. Typical is the following:

"I'm overworked and underpaid. Sometimes it seems there are only two choices left to me — the third, suicide, wouldn't help because I can't keep up the payments on suicide insurance.

"Either I'll have to have myself twinned so I can moonlight a second job — and I don't know what I could do that would cover the payments on the twinning — or else I'll have to go ten per cent deeper into hock and buy a wishing machine. At Cr. 25,000 or so they aren't cheap, but on the other hand the idea of making everything for ourselves seems wonderful. My wife says yes, get one, because

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it would be living like our ancestors used to, completely self-sufficient (we have strong pioneer traditions here on New Frontier), but I said no, I guess there may be a catch, let's wait till GOOD BUY covers them."

Not everyone, alas, has that much good sense. Over the past decade scores of news stories have testified to the fate of hasty purchasers who succumbed to wild advertising claims.

Swamped by debt, Ebenezer J. Younghusband of Venable's World boasted to his friends that he'd seen a way out of his difficuties. He mortgaged his grandchildren's earning capacity to buy a wishing machine. He envisaged making and selling uranium-235 on a rising market to recoup his expenditure. Three thousand casualties occurred, mostly fatal, when he allowed 10 kg. to accumulate in the hopper.

Likewise, rendered desperate by the problem of supporting her eleven children, widowed Mrs. Honoria Quonsett of Hysteria sold six of her offspring to an illegal service agency and invested in a wishing machine, thinking she could redeem them when it had stabilized her affairs. The machine she was able to afford was inadequately insulated against feedback from the user's subconscious, and—since she was naturally concerned with her children's fate above all — began to manufacture duplicates of them. The more frantic she grew, the more the machine churned out. As even the finest machine is unable to create a fully functioning human, something like 95 imbeciles are now a charge on the Hysterian government, and Mrs. Quonsett is permanently hospitalized.

So, if you're considering buying a wishing machine, bear three points in mind: the advertisers' claims are exaggerated; extreme care is always necessary in use; and — most important of all — these machines are *machines,* not magic wands!

Background

Immediately Charlie Voluminous MacDiomnaid, a century or so ago, turned "transmutation without radiation" from a vote-catching slogan into a practical reality. All technically advanced planets began to dream of short-circuiting the conventional manufacturing processes and creating articles at need from crude matter and raw energy.

In 2276 the first notable step towards this goal was accomplished accidentally on Cocahymnia, when Abdul Fidler gave up trying to describe the instruments he wanted to play his famous "Catastrophe Suite" and had himself spliced directly into

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the computer-operated controls of a woodwind factory. Further development led to one of the two essential elements of a modern manufacturing complex: the visualizer tube, which extracts from the mind of the person in charge the characteristics of the desired product.

The necessity for a second controlling element emerged when Fidler discovered that human musicians couldn't play the instruments he had devised. For his "Variations on the Theme of Planetary Collision" he attempted to surpass his earlier achievement and create a superior musician, too. The lifeform resulting had an enormous brain, incredibly acute hearing, 28 pairs of hands and sufficient mouths to play 11 wind instruments at once.

On seeing it, Fidler let out a cry of joy approximately a sixth of a tone below G flat *in altissimo*, and the creature — so sensitive it could not endure this deviation from perfect pitch — manipulated him until he was screaming exactly on the note. The loss of his talent was a severe blow to galactic music, but his death established the need for the moderator tube, charged with powers of judgement regarding the feasibility and permissibility of the product. Not unexpectedly, the immense range of the human imagination meant that the early installations had to be huge. The pilot version covered about a hectare of ground.

However, though such size confined the process to commercial undertakings, partial success was better than none and soon factories working on these principles were a common sight on prosperous planets.

The ultimate target — providing private consumers with home appliances that they need only switch on and think into — appeared as remote as ever until the genius of Gordian Bludgeon, a factory-hand on Odin, broke the deadlock.

One day, during a five-minute period of random thinking intended to clear his mind for a changeover from family spaceboats to sanitary appliances, he snapped his fingers and started to concentrate on the idea of an automatic twin-tube wishing machine no larger than a robochef.

It is pointless to deny that like so many geniuses Bludgeon enjoyed imperfect mental stability. However, it is indisputable that without his brilliant inspiration wishing machines for home use would not yet be available. Though refinements have subsequently been incorporated, every machine we saw was a modification of his original version.

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Chief among the refinements, incidentally, is the elimination of a circuit he included because his former girl-friend had just married the factory manager. It is now illegal to describe in print what this was intended to do, but by reading between the lines of the distorted account in Harold Knockermaker's *Bludgeon the Man* any averagely aggressive male should be able to figure it out.

Brands tested

We found a total of seven wishing machines that fitted the strict definition of "twin-tube" (i.e. having both a visualizer and a moderator) and "automatic" (i.e. not requiring the preliminary insertion of ready-made parts). All of them cost in the region of Cr. 25,000.

Cheaper models are on offer, but they lack the moderator tube. *They should not be bought under any circumstances.* The fact that Eblis is currently quarantined from the rest of the galaxy and languishing under the most savage dictatorship in history is directly attributable to the purchase by a Mrs. Phobia Luncheon of such a machine. Her five-year-old son Elgin, in a tantrum over the refusal of an ice cream soda, started the machine and set it to making nuclear-armed robot soldiers two meters tall, with whose aid he overran the planet and set up a drugstore with a soda fountain a kilometer long. (He is expected to die of malnutrition in about 2335, but it is impossible to estimate how many of Eblis's population will survive him.)

These are the models we tested, and the chief slogans used to advertise them:

CORNUCOPIA: "A Horn of Plenty in the Home."

MIDAS: "Better than the Golden Touch."

CROESUS: "Everything money can or can't buy."

INEXHAUSTIBLE: "Everyone is on the make!"

ZILLIONAIRE: "Beyond the dreams of avarice."

WIZARD: "Magical manufacturing."

DOMESTICATED DJINN: "There is no God but Allah; however, the profit is entirely yours."

The MIDAS and CROESUS, on inspection, proved to be identical except for the nameplate affixed to the front of the cabinet. The former costs Cr. 200 more than the latter. The makers refused to comment on this.

Appearance and finish

With the following qualifications the finish of the products was rated "acceptable" by our test panel.

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The CORNUCOPIA was nearly twice as big as the largest of the others, and the makers recommend that the first use it be put to after purchase is the construction of an extra room to hold it.

The output hopper supplied with the MIDAS and CROESUS imposed an arbitrary limit on the size of articles manufactured. Anything larger than approx. 2 x 3 meters came out concertinaed. In the end we sent for one of the range of non-standard oversize hoppers available at extra charge. (We tried making our own with the machine, but the tolerances were of the order of two micrometers and the controls were insufficiently precise.)

The DOMESTICATED DJINN was inscribed all over with excerpts from the Koran, and was time-switched to prevent its use when the owner was supposed to facing Mecca for prayer. Five periods of non-availability per day, each lasting fifteen minutes, may constitute a drawback in the view of non-Moslems.

The ZILLIONAIRE was smaller than the others in every respect including its visualizer cap, which fitted only one of our test panel (an eight-year-old boy chosen for the vividness of his imagination). We had to substitute the cap from the basically similar WIZARD. The user's chair was rated "very uncomfortable" by the entire panel, and we had to pack it with foam padding before anyone could sit through a production cycle.

The INEXHAUSTIBLE posed us several problems. Our attention had already been caught by the curious advertising copy announcing it. Sample: "MOST SPLENDIFEROUS THE NOT COSTLY WISHING MACHINE. YOU WANT, IT MAKE, NO MATTER WHATEVER THE DESIRE WITHIN REASONS OF COURSE!"

The attractive gray cabinet was finished in a manner we had not previously encountered. When touched, it humped and rubbed against the hand, at the same time secreting a gummy fluid with a strong smell resembling banana-oil. The output (no hopper was fitted) was on top of the casing and could only be reached by a stepladder. The controls were on two boards at opposite ends of the housing, which meant that unless the user's reach exceeded 3.2 m. and he had had the foresight to install wall-mirrors to reflect the dials he had to walk back and forth all the time. This was rendered difficult by the hard flat bench, tilted at 35°, fitted in place of a user's chair. Also there was no visualizer cap; 21

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separate leads had to be attached to the head with suction-cups, and the handbook advised shaving before use.

Instruction manuals, etc.

Handbooks were supplied with five of the machines. That for the CORNUCOPIA promised: "No adjustment will be required for at least one Earth Standard Year." But see below, *Performance*. The cheaper CROESUS had a handbook, the MIDAS did not, which seemed odd. We used the same for both. That for the DOMESTICATED DJINN opened with an invocation: "In the name of Allah, the Merciful, let no harm befall users of this machine!" Again, see below.

The ZILLIONAIRE had no instructions except a swing-ticket attached to the on-off switch, which read: "Any fault that develops in this machine can easily be rectified by having it produce a replacement part." We should like to repeat the comment of our eight-year-old, but this publication has to go through the galactic mails.

The instructions for the WIZARD were in 174 languages, an admirable idea. Unfortunately the text in 173 of them (the exception being High Canal Martian) referred to a model discontinued four years ago.

The manual for the INEXHAUSTIBLE had apparently been produced on the machine by an inexperienced operator. It was a handsome volume of about 100 pages, of which all but the first 16 were blank.

Guarantees

The guarantee for the CORNUCOPIA was acceptable, subject to the deletion (don't forget to thumbprint it in the margin) of the clause which runs: "The manufacturers will not be held liable for (a) the products of a diseased imagination; (b) operation of the machine by a minor; (c) death, disablement or disfigurement of any user by his/her productions."

None of the other guarantees was worth the permafilm they were printed in. The DOMESTICATED DJINN's stated, *inter alia*, "Omission of five-times-daily prayer voids this warranty." The ZILLIONAIRE's said: "We reserve the right to cancel this or any other ostensible warranty at out entire discretion." The INEXHAUSTIBLE's had at least the virtue of honesty (we think); it ran simply: "We decline responsibilities, all shapes, all sizes, all colors."

Power source and mode of operation

As stated above, all wishing

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machines on sale are similar to Bludgeon's original concept. The user sits in a chair (INEXHAUSTIBLE: scrambles back and forth over a sloping bench), puts on a cap connected to the visualizer (INEXHAUSTIBLE: shaves scalp and attaches 21 leads), adjusts manual controls to broad categories of mass, switches on the power and concentrates on visualizing the appearance and performance of a known end-product, or the performance of something desired but not hitherto invented. This eventually appears in the output hopper, or not, as the case may be.

The MIDAS, CROESUS and WIZARD were fitted with a useful extra: a warning bell on the moderator to indicate if production of the article had been vetoed. With the slower machines, especially the ZILLIONAIRE, it was sometimes possible to hang around hopefully for an hour or more before realizing that nothing would emerge.

The CORNUCOPIA, MIDAS/CROESUS and WIZARD draw domestic current on planets where a piped-plasma grid exists; otherwise they require a portable fusion plant. The DOMESTICATED DJINN and ZILLIONAIRE can also be run off solar or other energy sources, but performance on anything but plasma is unsatisfactory. The ZILLIONAIRE, using solar energy, required 6½ hours steady concentration to produce a meal for two people, which the hungry tester then immediately devoured.

The INEXHAUSTIBLE was unique in having to be primed with 12 kg. of technetium (this is apparently what the advertisements mean by "SELF CONTAINING SAUCE OF POWER — OUTSIDE POWER IS NEEDLES ! ! ! "). The cost of furnishing this initial load is about Cr. 17,000; however, an efficient auxiliary circuit kept the level of fuel constant, using thermal energy from the air of the room, providing sufficient downtime was allowed.

Performance

Theoretically a wishing machine will make almost anything, subject to the veto of the moderating tube. In practice, the latter is by no means consistent, and what you get out depends anyhow on how good you are at concentrating. (It also depends on how good the visualizer tube is at sifting conscious from subconscious mental images.)

It was clearly impossible to attempt a cross-section of users' desires. We settled for three groups of tests.

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First, we had to establish that everyday requirements could be met. We instructed the testers to make (a) a meal for two people which they personally enjoyed; (b) clothing for themselves, from hat to shoes; (c) an item of household equipment, preferably furniture.

All passed, with the following qualifications:

Food produced on the initial runs of the CORNUCOPIA resisted knives, forks and teeth, and its piece of furniture (a table) proved to be of collapsed steel. We had to send for a crane to remove it from the output hopper. Investigation showed that the Durability control needed adjustment; it was set to "101 per cent". A setting of 1 produced edible food and 25 produced usable furniture, in later runs.

Clothing manufactured on the MIDAS was adequately warm and waterproof, but when we sent out a lady tester in the garments she had made, to see how well they wore, the next we heard of her she was in jail on a charge of indecent exposure. Her and all other female clothing produced by this machine turned perfectly transparent one hour after putting on. A complaint to the makers produced an apology and a statement to the effect that the factory-hand in charge of this batch had been sent for psychotherapy to eliminate his Peeping Tom syndrome.

All the testers who ate meals prepared by the DOMESTICATED DJINN were hospitalized with acute food poisoning.

The INEXHAUSTIBLE needed enormous extra effort before it would produce food uncontaminated with bromine and arsenic and of any other color than purple (though some of our testers found purple steak and potatoes attractive visually, they tasted bad), or clothing less than 4 cm. in thickness, devoid of fibreglass scales and with sleeves less than 1.8 m. long.

Second, we had to establish that it was economical to produce household durables available through more conventional channels. We tried for a three-vee set, and an air-conditioner.

In all cases it was cheaper (sometimes 100 per cent cheaper) to buy commercially. However, the following points should be noted:

The CORNUCOPIA, in response to a tester who claimed not to have the faintest notion how a three-vee set works, produced one in working order, superior to any we have ever seen, and based on what proved to be a radical new means of receiving broadcast signals. We are working on this and hope short-

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ly to market a commercial version, which may go some way towards making up the anticipated deficit in next year's balance sheet. (See "Message from your Chairman", this issue.)

Sets made by the ZILLIONAIRE would not receive anything, but merely repeated what the tester was visualizing at the time. We had to fire one tester whose set depicted a positively obscene episode from "Peyton Planet". And those from the DOMESTICATED DJINN would receive only Mecca, Medina and New Cairo.

The air-conditioners mostly worked okay, except for the INEXHAUSTIBLES. After a few minutes' operation the room was full of the reek of chlorine; inspection showed that a minature transmuter had been set into the housing, which was busy getting rid of the oxygen in favor of chlorine, bromine, iodine and inert gases.

Finally we had to determine how safe the machines were. There is no galactic standard yet, but an Earthside law lays down that the moderator must prevent the creation of "any noxious or vicious article, object or creature whatsoever." Cut-outs built into the moderator are supposed to enforce this.

In practice, it's clear that definitions vary. Even on the best of the machines, the CORNUCOPIA, all testers were able to make infectious bacteria (see *Obituary,* inside back cover). And our eight-year-old, using the ZILLIONAIRE, was able to make a spanking machine, from which his parents were rescued in a state of extreme exhaustion; a suit of battle armor, his own size, in which to make good his escape; and enough sleepy-gas to blank out the ConGalFedCon-Ass Building as he was leaving.

Our performance tests of the INEXHAUSTIBLE were inconclusive. We were tempted to abandon them when we discovered that although insulation against subconscious feedback left something to be desired on all the machines, the insulation on this one tended to filter out conscious images and let subconscious ones go through. (The events which led us to this impression need not be gone into as the tests were abortive.)

However, we felt we owed it to our members to determine whether the extravagant claim implied in the trade name INEXHAUSTIBLE was true or false. Our change of address, noted on the inside front cover, stems largely from our persistence.

We decided to make up a cyclic tape for some article of which any family is likely to

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consume large quantities, and run it until the machine stopped working. Our first choice was paper handkerchiefs, but the machine's vulnerability to subconscious associations compelled the Greater Greater New York Public Health Authority to step in. (We are glad to learn, just before press-time, that the influenza epidemic is officially "under control".)

It was then suggested that the item of which a family consumes most is *money*.

This choice had the secondary advantage that the use of a wishing machine to make Galactic currency is counterfeiting, and if the machine's moderator permitted an illegal act we would be compelled to inform our members that it was an offence to buy one.

We regret to announce that on this test the machine performed flawlessly. Our calculations show that the technetium will run out when the pile of bills now covering the site of our former headquarters is about 320 meters high, unless a strong wind gets up, so the machine is not in fact "inexhaustible", but this is a slim consolation. (Anyone finding windblown bills, incidentally, is requested to forward them to the office of our Attorney for the Defense before the first of next month.)

NOT RECOMMENDED

We learn from the Superdistrict Attorney's staff that an investigation has been made into the origins of the INEXHAUSTIBLE. It emanates from a space-going factory parked about a thousand parsecs outside the galaxy in the direction of Andromeda. The authorities are proceeding on the assumption that it represents an economic assault by the dominant civilization of M-31. The design of it accords with the known characteristics of that race: they would be very comfortable on the sloping bench provided for the user, they have arms and eyes at both ends of their bodies and are extremely tall, so would be able to operate the divided controls as well as to fish the end-product out of the top, and they prefer an atmosphere of chlorine, iodine, neon and argon.

Do not — repeat, DO NOT — buy this machine! Apart from its being capable of an illegal act (counterfeiting), our advice is that it can only be properly controlled by an Andromedan. If you meet anyone who claims to have had no trouble with an INEXHAUSTIBLE, report him at once to the nearest office of the Galactic Bureau of Investigation. He's probably an Andromedan spy.

—JOHN BRUNNER

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Galaxy Bookshelf

By Algis Budrys

As you know, the problem with life is that nobody understands the situation. Nonetheless, we have to get through it as best we can. If there is a scheme to it all, it is sufficiently complex and covers sufficient spacetime so that only God could account for it. It is one of the primary purposes of commercial entertainment — and of art — to compensate us for the fact that none of us are God. It is the function of a statue to capture some small slice of something that we say is real, and hold it frozen for us to walk around and look until we are satisfied that we understand it. It is the function of a commercial novel, of the sort to which most science-fiction novels belong, to provide what Murray Leinster long ago called a "pocket universe." In this universe, the rules rapidly become comprehensible, or an assurance is quickly given that the rules will become comprehensible. There is a protaganist — a hero, or a fascinating villian, who becomes the reader's particular property, and whose movements, troubles and triumphs become the reader's own. In this way and for some little space of time, the reader inhabits a comprehensible world, and escapes from the real one.

This escape into an organized delusion — if you will, a systematic lie — is distinguishable from psychosis only by the fact that you can walk into a store and buy a package of it, the package having been provided by someone who deals in this service. As you know, psychosis is frowned upon, whereas reading is

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normally acceptable. Thus commerce does confer a certain absolution on us all.

Some kinds of books are automatically more popular than others, just as some individual books are more popular than others of their same kind. This means, apparently, that there are fashions in psychosis, just as there are degrees to which individual books please their readers — that is to say, provide a delusional system yummier than someone else's delusional system. It might even be possible to psychoanalyze a particular period of human history by running one's finger down a list of the best sellers. Thus, simple statistics and grubby pennies and dimes lay us all upon the psychiatrist's couch. Never doubt that some day some earnest Ph.D. candidate will not do all this for us; hopefully, not in my time or yours.

For now, come rummage through some pockets with me.

One of the simplest and most common pocket universes is the one in which life is fast, society is run on about as many rules as apply to tick-tack-toe, and if you're unhappy you can go shoot somebody. To this end, Joseph E. Levine has made a motion picture called *The Tenth Victim,* from a short story by Robert Sheckley, and Ballantine in turn has had Sheckley novelize the screenplay. (The original story, of course, appeared in *Galaxy.* The movie stars Marcello Mastroianni as a pleasant but essentially inept huntsman in a world where aggressions have been channeled into a kind of game described as "a safety valve for humanity's latent agressive instincts." His particular opponent in this story is Ursula Andress. Ursula is a quite proficient huntress. We first meet her as she guns down her ninth victim, using a rapid-fire bra. Their names in this story are Catherine and Marcello.

By the rules of the lottery in which registered citizens of this future world acquire the right to hunt each other, and to retire to fame and riches after killing their tenth victim, these two have now been more or less randomly chosen to compete. Society, in this universe, is so organized that nothing stands in their way, and a number of institutions exist to aid and encourage them in their endeavors. There are no legal bars to their activities — there are almost no places on Earth where they may not take pot shots at each other with guns, bombs, knifes or armed helicopters — and this is true to the point where the average poor citizen in the street nor-

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mally doesn't even have any warning that somebody is liable to set off a bomb to get the man beside him. Accordingly, despite whatever rationale the author of such a work may offer, what this is is kids playing cops and robbers.

In order to take this sort of story seriously, one must suspend considerably more disbelief than one needs in order to read a book such as *The Three Musketeers*. This is not a serious problem — the public eats up this kind of thing every day without blinking an eye; nevertheless, the Italian moviemakers, and thus Sheckley following along behind the script, have chosen to make this story a vehicle for satire in the Italian manner typified in such famous productions as *La Dolce Vita* and *8½*.

As you may have noticed, in order to understand *La Dolce Vita* and *8½*, you have to be "in." Otherwise you are in serious danger of losing some of the subtleties and the really masterful symbolic touches which make an indifferent and often boring story into a masterpiece of art. Now personally, I have actually had the privilege of seeing a roomful of these "in" people at a private preview showing of *8½*, and I must say it took them two or three hours to decide what the masterful touches were. My opinion is that if I have marched down to a drug store and handed somebody 60c for a book or into a movie house and handed somebody $1.80 to have the silver screen do most of my imagining for me — badly — I would prefer to get my return for value received on the spot, and without the need to go hunt up 180 others of my own kind in order to arrive at a consensus. Thus my tendency on being handed a book is to simply read it and notice while I am doing so whether I'm enjoying myself or not. My buying judgments of books lined up on a rack and offered for sale are formed on the same basis. I look at the cover design, I read the title, I read the blurbs. I turn the book over and skim rapidly over the back cover copy which, if carefully read, often tells me entirely too much about some of the surprises the author has planned to hand me, and then I am liable to flip a few pages and run my eye along a few paragraphs, just to see how well acquainted the writer is with prose.

My thinking in this area is that the publisher either is or is not a good professional and that the writer either is or is not the same, and what I am I after here, after all, is a professional service. Thus in glancing at Bal-

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lantine's package on *The Tenth Victim,* I find a very well executed jacket which tells me: "*a bullseye view of guns and lovers! Robert Sheckley's chilling futurama of legalized manslaughter.*" As you may have noticed, the package describes a book rather different from the book actually contained within its covers. There is no hint of satire, nor of symbolism. There is a picture of Urusla Andress with the crosshairs of a gunsight centered somewhere south of her navel, and if this is satire I will take broccoli. So, rectitudinously ignoring the reams of promotional literature which Ballantine sends to its review list, I plowed into this book and read it as I would have had I stumbled across it at the corner bookie's.

Read as a genuinely proffered pocket universe, this is a reasonably good chase novel which suffers from the fact that its protaganist, Marcello, doesn't really want to do any shooting, and doesn't really care if he gets shot or not. Ursula Andress, last prominently seen as the bikinied Honey in the motion picture *Dr. No,* goes through this book in the guise of Catherine just as deadpan as she was in the Ian Fleming movie, but without the utterly redeeming quality of being outstandingly visible.

There are some very nice, funny touches in the story. I don't know who contributed them, but Sheckley is quite capable of extremely good tongue-in-cheek deadpan humor on his own hook. There are some improbable and yet interesting visual effects described, as when the hut in which Marcello is resting is hooked to a helicopter and transported bodily to the Roman Coliseum, where its sides fall away in order that the climatic shooting of Marcello by Catherine may be covered by network television and dressed up as a Spectacular with the addition of ballet dancers and other marvelous effects. Nevertheless, you are liable to be disappointed by this book, no matter which way you approach it. If you wish to acquire in permanent form, a previously received cinematographic impression, you will get most of it from the inserted section of movie stills showing such things as Catherine's exploding brassiere and Marcello at the camp of the sun worshippers. (You are liable to be confused, as I was, by seeing that in the photo captions Ursula Andress is called Christine, that in the back cover blurb, she is called Catherine — which is the style I have been following, in my own slipshod way — and that in the actual text, which is presumably the way either Sheckley or Jo-

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seph E. Levine wanted it, she is called Caroline. But obviously it doesn't matter.) If you are really after a chilling futurama of legalized murder (not manslaughter), you are going to be put off by the book's rather flaky final chapters.

This book is primarily interesting not for what it is but for what it represents; the successful translation of a *Galaxy Magazine* short story called "Seventh Victim" into a major motion picture, starring some extremely expensive and skilled actors, using the resources of a major production company. This is not common, and probably represents Sheckley's accession, at last, into the larger world of high-paying, internationally accepted commercial work. There have been a number of very flossy science-fiction movies made, but this one is one of the very few in which money was spent on actors as well as production values. Most important, this motion picture represents the first clearly obvious top-line production effort by the European moviemakers and crews who have been taken up by the highly verbal "in" crowd — as a result, you may be sure that *The Tenth Victim,* and with it Robert Sheckley, will receive a great deal of critical attention, and that a number of imitations will be attempted. I am very glad to see this, because it represents a potential exploration of another world into which category magazine science fiction, and other category magazine science-fiction writers can expand.

One of the favorite pocket universes is the one in which nameless and overwhelming horror lurks behind every closet door and under every antimacassar. Some years ago, Theodore L. Thomas wrote a short story called "The Clone", which might very well have been called "The Thing from the Drain". He and Kate Wilhelm have now expanded this to a novel of the same title, and Berkley has published it.

The clone is a living organism which results from a chance combination of lifeless ingredients in the catch basin of a Chicago drain. By a perfectly believable combination of circumstances these various chemicals are warmed and nurtured to the point where a living cell begins to feed, react to stimuli and multiply. It then grows through the Chicago sewer system — and I am perfectly prepared to believe it has been there for years — chomping voraciously on everything it considers edible. Because its chemistry is somewhat different from ours, when it

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chomps on people, or, rather, absorbs them into its tissue, it rejects approximately seventy per cent of their water content. Thus while these people and the reader dissolve, a freshet of slightly brackish water pours from the advancing line of clone tissue working its way through flesh and muscle, blood and bone, eating the animal-organic clothing worn by the unfortunate victim, rejecting such items as cotton. After a while, all that remains is a puddle of water with a T-shirt floating in it. When you translate this into a department storeful of victims, with the clone grown up to the point where it covers an area miles square, this becomes a flood, a cataract, a torrent of warmish, mineral laden water cascading down the stairways, escalators and elevator shafts, spilling out into the street and choking the gutters. As the clone consumes its food supply, it begins to hunt for new sources of energy and nutriment. It develops the ability to shoot pseudopods in all directions. It develops the ability to extract nourishment from materials it had previously disdained, such as the lath behind a plaster wall, and the various other organic material associated with building materials. As a result, not only people but buildings, and all the other accoutrements of normal civilization, begin to totter and dissolve into the green heaving mass of the insenate clone.

This story of the thing that makes a mockery of all the works of Man and Man himself, in part because it is omnipotent, in larger part because it deserves no respect and is therefore all the more unreasonable in its power, is one of the favorite pocket psychoses with which people have been titillating themselves for generations. In times earlier than that, of course, the function of the clone was subsumed under the lesser duties of certain gods. This present example, to my mind is a very good one. My reasons for thinking so are that someone has worked out the chemistry of the clone, (Thomas is not only a patent attorney but an M.I.T. graduate), and the personalities of some of the characters who come in contact with the clone, (Kate Wilhelm does well with people under stress), with a quiet, technical competence that makes them rather convincing. There are few people in this book who run around screaming that this whole thing is a visitation for the Sins of Mankind, and there are few people who waste a great deal of time describing the green monstrosity as *"Evil!"* A great many of them quietly and systematically an-

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alyze the beast's properties and behavior patterns even while it is eating them. This may not make for obvious screaming tension, but I think it creates a more enduring impression of what happens to people in the face of something that guzzles them up despite all their piety and wit.

There is a hero in this story of course, and a heroine. They spend very little time clutching at each other, and in fact quite often are nowhere near each other as they move around the city of Chicago in the course of various attempts at rescue and battle. There is no particular vindication of a personal creed in the final victory over the clone. That is to say, when the clone is finally subdued, it does not prove the smart young technician Right, nor does it prove superstition Wrong. This is a sort of horror-procedural novel, in which people do more or less the best they can more or less consistently, and some of them turn out to be very heroic, while others turn out to be prosaic.

This is mostly nice circumstantial writing, of the sort that either Wilhelm or Thomas do very well all by themselves. I think that if you are going to read yourself a book describing a world which is in some way preferable to this one because the monsters in it are visible and describable, that this is a book for you.

Finally we have *The Squares of the City* by John Brunner (Ballantine).

Even more pernicious than the sophistry that life is like chess is the fallacy that a chess game is like a story. I was going to discourse with you at great length on the crucial differences between life and chess, as I see them, but after many pages of winding up to do so, I discovered on reaching the back end of Brunner's book that he was going to make all those points himself all along. This move on Brunner's part was particularly startling since the inside and outside of the book are plastered with urgent references to the fact that the entire plot of the book is modeled on an actual chess game played in Havana in 1892 between the masters Steinitz and Tchigorin. The publishers and Brunner seem convinced that this alone removes all doubt we have a literary classic on our hands.

Although Brunner understands about life and chess, he seems not to have understood about chess and stories. Possibly this entire thing is a response to a years-old complaint by James Blish who, in reviewing a Poul

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Anderson short story written around an imaginary chess game — which Blish found particularly uninspiring — complained that if you were going to do this kind of thing at all you should at least have the wit to use an actual game, and furthermore not a pedestrian one. Brunner seems to have taken up this challenge, and in his preface says things like this: "Following an introductory section, the action of the story goes *move-for-move with a famous chess game,* every piece on the board having a human counterpart." (Italics Brunner's). "Ever since Lewis Carroll wrote *Through the Looking Glass,* fantasy authors have been fascinated by the chess game fantasy. I honestly believe this is the most successful of its kind so far . . . I do not think there is any artificiality or contrivance apparent, and this story can be read on either of two levels — by the chess addict with the game beside him for reference, or by anyone else for its own sake."

Well, I don't know about the chess addict, since I am not one, but I seriously doubt the second half of Brunner's proposition. Read as a story for its own sake, this is a confusing, overpopulated, almost unindentifiable-with story set in a city which seems to have been created for the sole purpose of letting Brunner set a "human chess game" in motion upon it.

As you know, there are thirty-two pieces on a chess board, and in the particular game used as a model here there were thirty-eight moves. Even for a book which occupies 307 pages of very closely set text, it has too many plot turns, too many characters to follow. As usual when a commercial author of average competence attempts to write a book this long, around as ambitious a plan as this, many parts of the final third of the book are skimpy narrations of events which would have been detailed with loving care and attention had they occurred in the earlier parts of the manuscript when the author was still fresh. This is not to say that the average commercial writer is not as skilled as the average writer of novels projected for a more ambitious reason. It is to say that if he writes for a living at commercial rates, he does not have time enough, and that he will save himself a number of ambitious failures, and considerable grief and heartache, if he takes this factor into account. He will also not participate in what often uncomfortably amounts to an ingratiating and naive attempt to take money from the reader under false pretenses.

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Now I have been questioned in the past about my tendency to review not only the text of a book, but the blurbs thereon and all the other appurtenances such as forewords, afterwords, indexes and appendices which go to make up the entire package. However, it seems to me — as it does to you — that when we walk into a store with the intention of spending money on books, what usually determines our choice is what the books look like, and what written information is immediately and readily available to us on its outside surfaces, rather than anything that may be going on inside.

Thus I want to know what justification Ballantine has for blurbing this as "one of the ten best science fiction novels of the year." I want to know why it wasn't nine, or eleven, or one hundred and forty-four. I want to know why Ballantine has seen fit to append to the back cover a statement which goes into paroxysms of delight that the last times they described something as "one of the ten best" they were speaking of Edgar Pangborn's *Davy*, a reprint, and of Leiber's *The Wanderer*, a book that could not miss with the coterie readership, for coterie reasons. This novel is not one of the ten best of anything. It is an interesting, professionally written, more or less professionally produced package selling for 75c, and that is all it it. The author does not have the previous reputation of either Pangborn or Fritz Leiber (who won a Hugo for himself and Ballantine with *The Wanderer*), and it is frankly and objectively not in the class of a book written by the two previously named commercial artists. Brunner is a workaday technician with an exaggerated sense of how much of his intelligence and awareness of the world gets translated into the prose he turns out. These are as close to being verified facts as opinions can ever be, and I'm a little bit disappointed in Ballantine.

Ballantine, which previously participated in the screw-up on the name of the heroine in *The Tenth Victim*, has this time screwed up the name of the hero throughout the Page One blurb on *The Squares of the City*. Without fail, they call him "Haklyut" five times. They never do call him "Hakluyt" which is not only what the author calls him, but what the author knew and was careful to note in the story itself as a famous name. I will be damned if I will let this type of editorial carelessness go by unnoticed. It is important that the packages be professionally and carefully

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done, because if they are not, a worthy text may suffer for it. Even if the text is not worthy (Shackley's may be, Brunner's not only may be, but at least represents an enormous amount of labor, a high degree of intelligence and considerable personal involvement), a series of slipshod packages from a publisher will impair the sales, and thus the popularity and reputation, of other writers whose books appear under the same imprint. In their choice of blurbs, blurb writers, editors, and of any previous reviews they may wish to quote on the covers of their books, the publishers speak not only for the book contained therein, but for themselves, for all the writers on their list, and for all writers generally, in more or less that order of effectiveness. It costs no more to do it right than it does to do it wrong.

As far as the story itself goes, there is considerable interesting thinking to be derived from it. Boyd Hakluyt is a traffic analyst — a man whose specialty is that of analyzing the flow of human beings and their personal and service vehicles through a city, for the purpose of arriving at intelligent plans for channelling this flow. The work done as a result of Hakluyt's professional service does not consist merely of putting up a new throughway or a stop sign; various unobtrusive psychological devices such as making a street a little bit more attractive to drive through, or a little bit less so, are used to increase or decrease the speed with which traffic will feed along a given route. Furthermore, the layout of a street system can be used to create areas in which it is more natural to put up one kind of shopping center, or residential area, in preference to any other. I find this an interesting occupational specialty, and consider it a legitimate vehicle for science-fiction exploration.

There are also a very few but effective scenes which attain a certain pictorial splendor, such as the climactic looting and destruction in the city to which Hakluyt has come. The city is Ciudad Vados, in the fictional Latin American country of Aguazul. Ciudad Vados, like contemporary Brasilia, is an artificially created city carved new and shiny out of previously barren ground at the decree of a strong and single-minded ruler. Ciudad Vados is, in the story, famous throught the world as the most modern city on the face of the Earth, and of course was planned exhaustively before ever a stick was cleared or footing dug. In consequence, the expectation was that the city

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would be a flawless place in which to live, work and govern.

In actual practice however, the construction of the city, and the subsequent drain on the resources of the countryside, have displaced and discommoded the native peasant population of Aguazul. Some of these peasants have remained out in the countryside, or in the older, organically evolved cities of the land, where they live in squalor and discontent. Others have moved into the city, and set up markets, shacks, warrens and rookeries of tin, plywood and paper wherever they can find room to do so — in one instance, interlacing their squalid dwellings among the supporting girders under the main monorail station.

Like mantis eggs and tent caterpillar cocoons on a rock crystal mulberry tree carved for a Chinese emperor's delectation, these pests and infestations cause no end of anguish to Vados, the dictator who originally decreed this pleasure dome, and furnish no end of kindling for various political flare-ups which go on and on in Ciudad Vados just as if it were, for example, Brasilia. Hakluyt takes it as his contract to simply solve the traffic flow problems. Vados takes it as his job to create artificial traffic flows right through the areas of peasant infestation, so as to furnish a convenient, modern, up-to-date, and most important, outside excuse to wipe out the paisanos.

Hakluyt gets caught up in the vicious political quarrels which are taking place between the representatives of Vado's adherents and the representatives of the peasantry. Eventually the peasants rise in revolt, and there is a lot of hurrahing and shouting, from which Hakluyt begins to flee, but to which he returns at the last moment because he has become transformed from the detached, neutral, salaried expert to a human being more or less passionately involved in the fate of people as distinguished from the flow of traffic units.

From the point of view of literary criticism, Hakluyt's transformation comes too late, too abruptly, apparently because the book was getting to be too damn long. His love interest, which was aroused briefly at the very beginning of the book, is not at all convincing when it recurs at the end. It seems to recur at the end only because, what the hell, you've got to have a love interest. What happens in between is considerably clumsier than one might like to have it.

If you were going to plot a story to correspond to a chess game, in which pieces moved to-

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ward the removal from the board of themselves or of other pieces, and if some of them are at the very outset of the game assigned an arbitrary order of importance which has nothing to do with any capacity for growth but only with arbitrary abilities to change position, you are going to have a whole lot of monolithic characters introduced who are built up to considerable extent only to be wiped off suddenly by murder, suicide and kidnapping. When this has to happen to ten or a dozen principal characters, let me assure you that the tenth victim seems nowhere near as interesting in his agony as did the first.

What happens if we strip away the chess game gimmick is that the protoganist, who tells the story in the first person, is really a nasty young man who happens to have a marketable skill, and who is *forever* insisting upon his rights, who is sent to a country that does not exist and a city that does not exist to deal with people who do not exist, and who thinks of all of them, very nearly to the absolute utter very end, as just so many units. There is nothing in particular here to catch and hold the reader's involvement in a universe which he might like to enter. In fact, he is led to suspect that if he did enter it, Hakluyt would be standing there with his clipboard, sharply questioning him as to his motives, point of origin and destination — three questions that people who read books are hoping to escape answering.

Pocket universes are all well and good. I am fond of them, both commercially and personally, but pocket universes should not have signs all over them reading "Pocket Universe!" and pocket universes should not have a visible fold down the middle.

— ALGIS BUDRYS

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When I Was Miss Dow

by SONYA DORMAN

Once it was a human being
— now it preyed on them!

These hungry, mother-haunted people come and find us living in what they like to call crystal palaces, though really we live in glass places, some of them highly ornamented and others plain as paper. They come first as explorers, and perhaps realize we are a race of one sex only, rather amorphous beings of proteide; and we, even baby I, are Protean, also, being able to take various shapes at will. One sex, one brain lobe, we live in more or less glass bridges over the humanoid chasm, eating, recreating, attending races and playing other games like most living creatures.

Eventually, we're all dumped into the cell banks and reproduced once more.

After the explorers comes the colony of miners and scientists. The warden and some of the other elders put on faces to greet them, agreeing to help with the mining of some ores, even giving them a koota or two as they become interested in our racing dogs. They set up their places of life, pop up their machines, bang-bang, chug-chug; we put on our faces, forms, smiles and costumes; I am old enough to learn to change my shape, too.

The Warden says to me, "It's about time you made a change, yourself. Some of your friends are already working for these people, bringing home credits and sulfas."

My Uncle (by the Warden's fourth conjunction) made himself over at the start, being one of the first to realize how it could profit us.

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I protest to the Warden, "I'm educated and trained as a scholar. You always say I must remain deep in my mathematics and other studies."

My Uncle says, "You have to do it. There's only one way for us to get along with them," and he runs his fingers through his long blonde hair. My Uncle's not an educated person, but highly placed, politically, and while Captain Dow is around my Uncle retains this particular shape. The Captain is shipping out soon, then Uncle will find some other features, because he's already warned that it's unseemly for him to be chasing around in the face of a girl after the half-bearded boys from the space ships. I don't want to do this myself, wasting so much time, when the fourteen decimals even now are clicking on my mirrors.

The Warden says, "We have a pattern from a female botanist, she ought to do for you. But before we put you into the pattern tank, you'll have to approximate another brain lobe. They have two."

"I know," I say, sulkily. A botanist. A she!

"Into the tank," the Warden says to me without mercy, and I am his to use as he believes proper.

I spend four days in the tank absorbing the female Terran pattern. When I'm released, the Warden tells me, "Your job is waiting for you. We went to a lot of trouble to arrange it." He sounds brusque, but perhaps this is because he hasn't conjoined for a long time. The responsibilities of being Warden of Mines and Seeds come first, long before any social engagement.

I run my fingers through my brunette curls, and notice my Uncle is looking critically at me. "Haven't you made yourself rather old?" he asks.

"Oh, he's all right," the Warden says. "Thirty-three isn't badly matched to the Doctor, as I understand it."

Dr. Arnold Proctor, the colony's head biologist, is busy making radiograph pictures (with his primitive X-rays) of skeletal structures: murger birds, rodents, and our pets and racers, the kootos—dogs to the Terrans, who are fascinated by them. We breed them primarily for speed and stamina, but some of them carry a gene for an inherited structural defect which cripples them and they have to be destroyed before they are full grown. The Doctor is making a special study of kootas.

He gets up from his chair when I enter his office. "I'm Miss Dow, your new assistant," I say, hoping my long fingernails will stand up to the pressure of

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punch keys on the computer, since I haven't had much practise in retaining foreign shapes. I'm still in uncertain balance between myself and Martha Dow, who is also myself. But one does not have two lobes for nothing, I discover.

"Good morning. I'm glad you're here," the Doctor says.

He is a nice, pink man, with silver hair, soft-spoken, intelligent. I'm pleased, as we work along, to find he doesn't joke and wisecrack like so many of the Terrans, though I am sometimes whimsical. I like music and banquets as well as my studies.

Though absorbed in his work, Dr. Proctor isn't rude to interrupters. A man of unusual balance, coming as he does from a culture which sends out scientific parties that are ninety per cent of one sex, when their species provides them with two. At first meetings he is dedicated but agreeable, and I'm charmed.

"Dr. Proctor," I ask him one morning. "Is it possible for you to radiograph my koota? She's very fine, from the fastest stock available, and I'd like to breed her."

"Yes, yes, of course," he promises with his quick, often absent, smile. "By all means. You wish to breed only the best." It's typical of him to assume we're all as dedicated as he.

My Uncle's not pleased. "There's nothing wrong with your koota," he says. "What do you want to X-ray her for? Suppose he finds something is wrong? You'll be afraid to race or breed her, and she won't be replaced. Besides, your interest in her may make him suspicious."

"Suspicious of what?" I ask, but my Uncle won't say, so I ask him, "Suppose she's bred and her pups are cripples?"

The Warden says, "You're supposed to have your mind on your work, not on racing. The koota was just to amuse you when you were younger."

I lean down and stroke her head, which is beautiful, and she breathes a deep and gentle breath in response.

"Oh, let him go," my Uncle says wearily. He's getting disgusted because they didn't intend for me to bury myself in a laboratory or a computer room, without making more important contacts. But a scholar is born with a certain temperament, and has an introspective nature, and as I'm destined to eventually replace the Warden, naturally I prefer the life of the mind.

"I must say," my Uncle remarks, "you look the image of a Terran female. Is the work interesting?"

"Oh, yes, fascinating," I reply, and he snorts at my lie, since we

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both know it's dull and routine, and most of the time is spent working out the connections between my two brain lobes, which still present me with some difficulty.

My koota bitch is subjected to a pelvic radiograph. Afterwards, I stand on my heels in the small, darkened cubicle, looking at the film on the viewing screen. There he stands, too, with his cheekbones emerald in the peculiar light, and his hair, which is silver in daylight, looks phosphorescent. I resist this. I am resisting this Doctor with the X-ray eyes who can examine my marrow with ease. He sees Martha's marrow, every perfect corpuscle of it.

You can't imagine how comforting it is to be so transparent. There's no need to pretend, adjust, advance, retreat or discuss the oddities of my planet. We are looking at the X-ray film of my prized racer and companion to determine the soundness of her hip joints, yet I suspect the Doctor, platinum-green and tall as a tower, is piercing my reality with his educated gaze. He can see the blood flushing my surfaces. I don't need to do a thing but stand up straight so the crease of fat at my waist won't distort my belly button, the center of it all.

"You see?" he says.

I do see, looking at the film in the darkness where perfection or disaster may be viewed, and I'm twined in the paradox which confronts me here. The darker the room, the brighter the screen and the clearer the picture. Less light! and the truth becomes more evident. Either the koota is properly jointed and may be bred without danger of passing the gene on to her young, or she is not properly jointed, and cannot be used. Less light, more truth! And the Doctor is green sculpture—a little darker and he would be a bronze—but his natural color is pink alabaster.

"You see," the Doctor says, and I do try to see. He points his wax pencil at one hip joint on the film, and says, "A certain amount of osteo-arthritic build-up is already evident. The cranial rim is wearing down, she may go lame. She'll certainly pass the defect on to some of her pups, if she's bred."

This koota has been my playmate and friend for a long time. She retains a single form, that of koota, full of love and beautiful speed; she has been a source of pleasure and pride.

Dr. Proctor, of the pewter hair, will discuss the anatomical defects of the koota in a gentle and cultivated voice. I am disturbed. There shouldn't be any need to

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explain the truth, which is evident. Yet it seems that to comprehend the exposures, I require a special education. It's said that the more you have seen, the quicker you are to sort the eternal verities into one pile and the dismal illusions into another. How is it that sometimes the Doctor wears a head which resembles that of a koota, with a splendid muzzle and noble brow?

Suddenly he gives a little laugh and points the end of the wax pencil at my navel, announcing: "There. There, it is essential that the belly button onto the pelvis, or you'll bear no children." Thoughts of offspring had occurred to me. But weren't we discussing my racer? The radiograph film is still clipped to the view screen, and upon it, spread-eagled, appears the bony Rorschach of my koota bitch, her hip joints expressing doom.

I wish the Doctor would put on the daylight. I come to the conclusion that there's a limit to how much truth I can examine, and the more I submit to the conditions necessary for examining it, the more unhappy I become.

Dr. Proctor is a man of such perfect integrity that he continues to talk about bones and muscles until I'm ready to scream for mercy. He has done something that is unusual and probably prohibited, but he's not aware of it. I mean it must be prohibited in his culture, where it seems they play on each other, but not with each other. I am uneasy, fluctuating.

He snaps two switches. Out goes the film and on goes the sun, making my eyes stream with sensitive and grateful tears, although he's so adjusted to these contrasts he doesn't so much as blink. Floating in the sunshine I've become opaque. He can't see anything but my surface tensions, and I wonder what he does in his spare time. A part of me seems to tilt, or slide.

"There, there, oh dear, Miss Dow," he says, patting my back, rubbing my shoulder blades. His forearms and fingers extend gingerly. "You do want to breed only the best, don't you?" he asks. I begin within me a compulsive ritual of counting the elements; it's all I can do to keep communications open between my brain lobes. I'm suffering from eclipses: one goes dark, the other lights up, that one goes dark, the other goes nova.

"There, there," the Doctor says, distressed because I'm quivering and trying to keep the connections open; I have never felt clogged before. They may have to put me back into the pattern tank.

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Profoundly disturbed, I lift my face, and he gives me a kiss. Then I'm all right, balanced again, one lobe composing a concerto for virtix flute, the other one projecting, "Oh Arnie, oh Arnie." Yes, I'm okay for the shape I'm in. He's marking my joints with his wax pencil (the marks of which can be easily erased from the film surface) and he's mumbling, "It's essential, oh yes, it's essential."

Finally he says, "I guess all of us colonists are lonely here," and I say, "Oh yes, aren't we," before I realize the enormity of the Warden's manipulations, and what a lot I have to learn. Evidently the Warden triple-carded me through the Colony Punch Center as a Terran. I lie and say, "Oh, yes. Yes, yes. Oh, Arnie, put out the light," for we may find some more truth.

"Not here," Arnie says, and of course he's right. This is a room for study, for cataloguing obvious facts, not a place for carnival. There are not many places for it, I discover with surprise. Having lived in glass all my life I expect everyone else to be as comfortable there as I am but this isn't so.

Just the same we find his quarters, after dark, to be comfortable and free of embarrassment. You wouldn't think a dedicated man of his age would be so vigorous, but I find out he spends his weekends at the recreation center hitting a ball with his hand. The ball bounces back off a wall and he hits it and hits it. Though he's given that up now because we're together on weekends.

"You're more than an old bachelor like me deserves," he tells me.

"Why are you an old bachelor?" I ask him. I do wonder why, if it's something not to be.

He tries to explain it to me. "I'm not a young man. I wouldn't make a good husband, I'm afraid. I like to work late, to be undisturbed. In my leisure time, I like to make wood carvings. Sometimes I go to bed with the sun and sometimes I'm up working all night. And then children. No. I'm lucky to be an old bachelor," he says.

Arnie carves kaku wood, which has a brilliant grain and is soft enough to permit easy carving. He's working on a figure of a murger bird, whittling lengthwise down the wood so the grain, wavy, full of flowing, wedge-shaped lines, will represent the feathers. The lamp light shines on his hair and the crinkle of his eyelids as he looks down and carves, whittles, turns. He's absorbed in what he doesn't see there but he's projecting what he

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wants to see. It's the reverse of what he must do in the viewing room. I begin to suffer a peculiar pain, located in the nerve cluster between my lungs. He's not talking to me. He's not carressing me. He's forgotten I'm here, and like a false projection, I'm beginning to fade. In another hour perhaps the film will become blank. If he doesn't see me, then am I here?

He's doing just what I do when absorbed in one of my own projects, and I admire the intensity with which he works: it's magnificent. Yes, I'm jealous of it. I burn with rage and jealousy. He has abandoned me to be Martha and I wish I were myself again, free in shape and single in mind. Not this sack of mud clinging to another. Yet he's teaching me that it's good to cling to another. I'm exhausted from strange disciplines. Perhaps he's tired, too; I see that sometimes he kneads the muscles of his stomach with his hands, and closes his eyes.

The Warden sits me down on one of my rare evenings home, and talks angrily. "You're making a mistake," he says. "If the Doctor finds out what you are, you'll lose your job with the colony. Besides, we never supposed you'd have a liaison with only one man. You were supposed to start with the Doctor, and go on from there. We need every credit you can bring in. And by the way, you haven't done well on that score lately. Is he stingy?"

"Of course he isn't."

"But all you bring home in credits is your pay."

I can think of no reply. It's true the Warden has a right to use me in whatever capacity would serve us all best, as I will use others when I'm a Warden, but he and my Uncle spend half the credits from my job on sulfadiazole, to which they've become addicted.

"You've no sense of responsibility," the Warden says. Perhaps he's coming close to time for conjunction again, and this makes him more concerned about my stability.

My Uncle says, "Oh, he's young, leave him alone. As long as he turns over most of those pay credits to us. Though what he uses the remainder for, I'll never know."

I use it for clothes at the Colony Exchange. Sometimes Arnie takes me out for an evening, usually to the Laugh Tree Bar, where the space crews, too, like to relax. The bar is the place to find joy babies; young, pretty, planet-born girls who work at the Colony Punch Center during the day, and spend their evenings here competing for the attention of the officers. Sitting here with Arnie, I can't distinguish a

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colonist's daughter from one of my friends or relatives. They wouldn't know me, either.

Once, at home, I try to talk with a few of these friends about my feelings. But I discover that whatever female patterns they've borrowed are superficial ones; none of them bother to grow an extra lobe, but merely tuck the Terran pattern into a corner of their own for handy reference. They are most of them on sulfas. Hard and shiny toys, they skip like pebbles over the surface of the colonists' lives.

Then they go home, revert to their own free forms, and enjoy their mathematics, colors, compositions, and seedings.

"Why me?" I demand of the Warden. "Why two lobes? Why me?"

"We felt you'd be more efficient," he answers. "And while you're here, which you seldom are these days, you'd better revert to other shapes. Your particles may be damaged if you hold that woman form too long."

Oh, but you don't know, I want to tell him. You don't know I'll hold it forever. If I'm damaged or dead, you'll put me into the cell banks, and you'll be amazed, astonished, terrified, to discover that I come out complete, all Martha. I can't be changed.

"You little lump of protagon," my Uncle mumbles bitterly. "You'll never amount to anything, you'll never be a Warden. Have you done any of your own work recently?"

I say, "Yes, I've done some crystal divisions, and re-grown them in non-established patterns." My Uncle is in a bad mood, as he's kicking sulfa and his nerve tissue is addled. I'm wise to speak quietly to him, but he still grumbles.

"I can't understand why you like being a two-lobed pack of giggles. I couldn't wait to get out of it. And you were so dead against it to begin with."

"Well, I have learned," I start to say, but can't explain what it is I'm still learning, and close my eyes. Part of it is that on the line between the darkness and the brightness it's easiest to float. I've never wanted to practise only easy things. My balance is damaged. I never had to balance. It's not a term or concept that I understand even now, at home, in free form. Some impress of Martha's pattern lies on my own brain cells. I suspect it's permanent damage, which gives me joy. That's what I mean about not understanding it. I am taught to strive for perfection. How can I be pleased with this, which may be a catastrophe?

Arnie carves on a breadth of

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kaku wood, bringing out to the surface a seascape. Knots become clots of spray, a flaw becomes wind-blown spume. I want to be Martha. I'd like to go to the Laugh Tree with Arnie, for a good time, I'd like to learn to play cards with him.

You see what happens: Arnie is, in his way, like my original self, and I hate that part of him, since I've given it up to be Martha. Martha makes him happy, she is chocolate to his appetite, pillow for his weariness.

I turn for company to my koota. She's the color of morning, her chest juts out like an axe blade, her ribs spring up and back like wings, her eyes are large and clear as she returns my gaze. Yet she's beyond hope; in a little time, she'll be lame; she cannot race any more, she must not mother a litter. I turn to her and she gazes back into my eyes, dreaming of speed and wind on the sandy beaches where she has run.

"Why don't you read some tapes?" Arnie suggests to me, because I'm restless and I disturb him. The koota lies at my feet. I read tapes. Every evening in his quarters Arnie carves, I read tapes, the broken racer lies at my feet. I pass through Terran history this way. When the clown tumbles into the tub, I laugh. Terran history is full of clowns and tubs; at first it seems that's all there is, but you learn to see beneath the comic costumes.

While I float on the taut line, the horizon between light and dark, where it's so easy, I begin to sense what is under the costumes: staggering down the street dead drunk on a sunny afternoon with everyone laughing at you; hiding under the veranda because you made blood come out of Pa's face; kicking a man when he's in the gutter because you've been kicked and have to pass it on. Tragedy is what one of the Terrans called being a poet in the body of a cockroach.

"Have you heard the rumor?" Arnie asks, putting down the whittling tool. "Have you heard that some of the personnel in Punch Center aren't really humans?"

"Not really?" I ask, putting away the tape. We have no tragedy. In my species, family relationships are based only on related gene patterns; they are finally dumped into the family bank and a new relative is created from the old. It's one form of ancient history multiplying itself, but it isn't tragic. The koota, her utility destroyed by a recessive gene, lies sleeping at my feet. Is this tragedy? But she is a single form, she can't regenerate a lost limb, or exfoliate brain

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tissue. She can only return my gaze with her steadfast and affectionate one.

"What are they, then?" I ask Arnie. "If they're not human?"

"The story is that the local life forms aren't as we really see them. They've put on faces, like ours, to deal with us. And some of them have filtered into personnel."

Filtered! As if I were a virus.

"But they must be harmless," I say. "No harm has come to anyone."

"We don't know that for a fact," Arnie replies.

"You look tired," I say, and he comes to me, to be soothed, to be loved in his flesh, his single form, his search for the truth in the darkness of the viewing cubicle. At present he's doing studies of murger birds. Their spinal cavities are large, air-filled ovals, and their bone is extremely porous, which permits them to soar to great heights.

The koota no longer races on the wind-blown beaches; she lies at our feet, looking into the distance. The wall must be transparent to her eyes, I feel that beyond it she sees clearly how the racers go, down the long, bright curve of sand in the morning sun. She sighs, and lays her head down on her narrow, delicate paws. I look into the distance too: bright beaches and Arnie, carrying me from his ship. But he will not carry me again.

Arnie says. "I seem to be tired all the time." He puts his head on my breast. "I don't think the food's agreeing with me, lately."

"Do you suffer pains?" I ask him, curiously.

"Suffer," he mutters. "What kind of nonsense is that, with analgesics. No I don't suffer. I just don't feel well."

He's absorbed in murger birds, kaku wood, he descends into the bottom of the darks and rises up like a rocket across the horizon into the thin clarity above, while I float. I no longer dare to breathe I'm afraid of disturbing everything. I do not want anything. His head lies gently on my breast and I will not disturb him.

"Oh. My God," Arnie says, and I know what it's come to, even before he begins to choke, and his muscles leap although I hold him in my arms. I know his heart is choking on massive doses of blood; the brilliance fades from his eyes and they begin to go dark while I tightly hold him. If he doesn't see me as he dies, will I be here?

I can feel, under my fingers, how rapidly his skin cools. I must put him down, here with his carvings and his papers, and I must go home. But I lift Arnie

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in my arms, and call the koota, who gets up rather stiffly. It's long after dark, and I carry him slowly, carefully, home to what he called a crystal palace, where the Warden and my Uncle are teaching each other to play chess with a set some space captain gave them in exchange for seed crystals. They sit in a bloom of light, sparkling, their old brains bent over the chessmen, as I breathe open the door and carry Arnie in.

First, my Uncle gives me just a glance, but then another glance, and a hard stare. "Is that the Doctor?" he asks.

I put Arnie down and hold one of his cold hands. "Warden," I say, on my knees, on eye level with the chessboard and its carved men. "Warden, can you put him in one of the banks?"

The Warden turns to look at me, as hard as my Uncle. "You've become deranged, trying to maintain two lobes," he says. "You cannot reconstitute or recreate a Terran by our methods, and you must know it."

"Over the edge, over the edge," my Uncle says, now a blond, six-foot, hearty male Terran, often at the Laugh Tree with one of the joy babies. He enjoys life, his own or someone else's. I have, too, I suppose. Am I fading? I am, really, just one of Arnie's projections, a form on a screen in his mind. I am not, really, Martha. Though I tried.

"We can't have him here," the Warden says. "You better get him out of here. You couldn't explain a corpse like that to the colonists, if they come looking for him. They'll think we did something to him. It's nearly time for my next conjunction, do you want your nephew to arrive in disgrace? The Uncles will drain his bank."

The Warden gets up and comes over to me. He takes hold of my dark curls and pulls me to my feet. It hurts my physical me, which is Martha. God knows Arnie, I'm Martha, it seems to me. "Take him back to his quarters," the Warden says to me. "And come back here immediately. I'll try to see you back to your own pattern, but it may be too late. In part, I blame myself. If you must know. So I will try."

Yes, yes, I want to say to him; as I was, dedicated, free; turn me back into myself, I never wanted to be anyone else, and now I don't know if I am anyone at all. The light's gone from his eyes and he doesn't see me, or see anything, does he?

I pick him up and breathe the door out, and go back through the night to his quarters, where the lamp still burns. I'm going to leave him here, where he be-

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longs. Before I go, I pick up the small carving of the murger bird, and take it with me, home to my glass bridge where at the edge of the mirrors the decimals are still clicking perfectly, clicking out known facts; an octagon can be reduced, the planet turns at such a degree on its axis, to see the truth you must have light of some sort, but to see the light you must have darkness of some sort. I can no longer float on the horizon between the two because that horizon has disappeared. I've learned to descend, and to rise, and descend again.

I'm able to revert without help to my own free form, to re-absorb the extra brain tissue. The sun comes up and it's bright. The night comes down and it's dark. I'm becoming somber, and a brilliant student. Even my Uncle says I'll be a good Warden when the time comes.

The Warden goes to conjunction; from the cell banks a nephew is lifted out. The koota lies dreaming of races she has run in the wind. It is our life, and it goes on, like the life of other creatures.

SONYA DORMAN

★ ★ ★ ★ ★

FORECAST

Naturally next issue will have the conclusion of *Heisenberg's Eyes* by Frank Herbert. We don't have to tell you much about that; you can read Part One in this issue and see for yourself.

But there's *The Pipers of Dis,* by James Blish and Norman L. Knight. The Earth is pockmarked with a number of what look like malformed hills and valleys — in Canada, in Arizona, in Africa, among other places; from the air they reveal themselves to be meteorite craters. The youngest of them is tens of thousands of years old, but what would happen if that sort of planet-gouging meteorite were to strike the Earth today? Or worse still, a few centuries in the future, when the Earth's population approaches the critical mass of a trillion and there *are* no waste spaces? . . . That's what Blish and Knight are writing about in the next issue.

Then there's Keith Laumer — Brian Aldiss — Willy Ley's *For Your Information* and Algis Budrys's *Galaxy Bookshelf;* and there'll be more stories, too. As many as we can fit into the 192 pages that makes *Galaxy* science fiction's biggest bargain!

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Open The Sky

by ROBERT SILVERBERG

Illustrated by MORROW

His disciples ruled three worlds. Then he gave them away — to win a universe!

I

The surgical amphitheater was a chilly horseshoe lit by a pale violet glow. At the north end, windows on the level of the second gallery admitted frosty New Mexico sunlight.

From where he sat, overlooking the operating table, Noel Vorst could see the bluish mountains in the middle distance beyond the confines of the research center. The mountains did not interest him. Neither did what was taking place on the operating table. But he kept his lack of interest to himself.

Vorst had not needed to attend the operation in person, of course. He knew already that a successful outcome was improbable. So did everyone else. But the Founder was 144 years old, and thought it useful to appear in public as often as his strength could sustain the effort. It did not do to have people think he had lapsed into senility.

Down below, the surgeons were

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clustered about a bare brain. Vorst had watched them lift the dome of a skull and thrust their scalpels of light deep into the wrinkled gray mass. There were ten billion neurons in that block of tissue, and an infinity of axonal terminals and dendritic receptors. The surgeons hoped to rearrange the synaptic nets of that brain, altering the protein-molecular switchgear to render the patient more useful to Vorst's plan.

Folly, the old man thought. He kept his pessimism to himself and sat quietly, listening to the pulsing of the blood in his own glossy artificial arteries.

What they were doing down there was remarkable, of course. Summoning all the resources of modern microsurgery, the leading men of the Noel Vorst Center for the Biological Sciences were altering the protein-protein molecular recognition patterns within a human brain. Twist the circuits about a bit; change the transsynaptic structures to build a better link between pre- and postsynaptic membranes; shunt individual synaptic inputs from one dendritic tree to another; in short, reprogram the brain to make it capable of doing whatever Noel Vorst wanted.

Which was to serve as the propulsive force needed to hurl a team of explorers across the gulf of light-years to another star.

It was an extraordinary project. For some fifty years the surgeons here at Vorst's Santa Fe research center had prepared for it by meddling with the brains of cats and monkeys and dolphins. Now they had at last begun operating on human subjects. The patient on the table was a middle-grade esper, a precog with poor timebinding ability; his life expectancy was on the order of six months, and then a burnout could be anticipated. The precog knew all about that, which was why he had volunteered to be the subject. The most skilful surgeons in the world were at work on him.

There were only two things wrong with the project, Vorst knew:

It was not likely to succeed.

And it was not at all necessary in the first place.

You do not tell a group of dedicated men, however, that their life's work is pointless. Besides, there was always the faint hope that they might artificially create a pusher — a telekinetic — down there. So Vorst dutifully attended the operation. The men on the amphitheater floor knew that the Founder's numinous presence was with them. Though they did not look up toward the gallery where Vorst sat, they knew the withered but still vigorous old man was smiling benign-

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ly down on them, cushioned against the pull of Earth by the webfoam cradle that sheltered his ancient limbs.

The lenses of his eyes were synthetic. The coils of his intestines had been fashioned from laboratory polymers. The stoutly pumping heart came from an organ bank. Little remained of the original Noel Vorst but the brain itself, which was intact though awash with the anticoagulants that preserved it from disabling strokes.

"Are you comfortable, sir?" the pale young acolyte at his side asked.

"Perfectly. Are you?" Vorst answered in a bantering tone.

The acolyte smiled at Vorst's little joke. He was only twenty years old, and full of pride because it was his turn to accompany the Founder on his daily round.

Vorst liked young people about him. They were tremendously in awe of him, naturally, but they managed to be warm and respectful without canonizing him. Within his body there throbbed the contributions of many a young Vorster volunteer: a film of lung tissue from one, a retina from another, kidneys from a pair of twins. He was a patchwork man, and he carried the flesh of his movement about with him.

The surgeons were bending low over the exposed brain down there. Vorst could not see what they were doing. A pickup embedded in a surgical instrument relayed the scene to a lambent screen on the level of the viewing gallery, but even the enlarged image did not tell Vorst much. Baffled and bored, he retained his look of lively interest all the same.

Quietly he pushed a communicator stud on his armrest and said, "Is Coordinator Kirby going to get here soon?"

"He's talking to Venus, sir."

"Who's he speaking to? Lazarus or Mondschein?"

"Mondschein, sir. I'll tell him to come to you as soon as he's off."

Vorst smiled. Protocol suggested that such high-level negotiations be carried on at the administrative level, between the executives and not between the prophets. So the second-in-commands were speaking: Hemispheric Coordinator Reynolds Kirby on behalf of the Vorsters of Earth, and Christopher Mondschein for the Harmonists who ran Venus. But in time it would be necessary to close the deal with a conference between those most closely in tune with the Eternal Oneness, and that would be the task of Vorst and Lazarus.

. . . *to close the deal* . . .

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A tremor pulled Vorst's right hand into a sudden claw. The acolyte swung around attentively, ready to jab buttons until he had restored the Founder's metabolic equilibrium. Grimly Vorst compelled the hand to relax.

"I'm all right," he insisted.

. . . to open the sky . . .

They were so close to the end, now, that it had all begun to seem like a dream. A century of scheming, playing chess with unborn antagonists, rearing a fantastic edifice of theocracy on a single slender, arrogant hope —

Was it madness, Vorst wondered, to wish to reshape the pattern of history?

Was it monstrous, he asked himself, to succeed?

On the operating table, the patient's leg came swimming up out of a sea of swathing and kicked fitfully and convulsively at the air. The anesthetist's fingers played over his console, and the esper who was standing by for such an emergency went into silent action. There was a flurry of activity about the table.

In that moment, a tall, fragile-looking old man entered the gallery and presented himself to Vorst.

"How's the operation going?" Reynolds Kirby asked.

"The patient just died," said Vorst. "Things seemed to be going so well, too."

II

Kirby had not expected much of the operation. He had discussed it fully with Vorst the day before; though he was no scientist himself, the Coordinator tried to keep abreast of the work being done at the research center.

His own sphere of responsibility was administrative; it was Kirby's job to oversee the far-flung secular activities of a religious cult that virtually ruled the planet. The Brotherhood of the Immanent Radiance, springing from a humble start, had captured the imaginations of Earth's billions with its promise of physical immortality and its dream of reaching the stars. It was almost ninety years since Kirby himself had been converted, and he had watched the cult grow mighty.

Political power, though it was useful to wield, was not supposed to be the Brotherhood's goal. The essence of the movement was its scientific program, centering on the facilities at Santa Fe. Here, over the decades, an unsurpassable factory of miracles had been constructed, lubricated by the cash contributions of billions of tithing Vorsters on every continent. And the miracles had been forthcoming. The regeneration processes now insured a predictable lifespan of three or four cen-

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turies for the newborn; perehaps more, for no one could be certain that immortality had been achieved until a few millennia of testing had elapsed. The Brotherhood could offer a reasonable facsimile of life eternal, at any rate, and that was a sufficient redemption of the promissory note on which the whole movement had been founded a hundred years before.

The other goal, though — the stars — had given the Brotherhood a harder pursuit.

Man was locked into his solar system by the limiting velocity of light. Chemical-fueled rockets and even ion-drive ships simply took too long to get about. Mars and Venus were within easy reach, but the cheerless outer planets were not, and the round trip to the nearest star would take a few decades by current technology, nine years even at the very best.

So man had transformed Mars into a habitable world, and he had transformed himself into something capable of inhabiting Venus. He mined the moons of Jupiter and Saturn, paid occasional visits to Pluto, and sent robots down to examine Mercury and the gas giants. And looked hopelessly to the stars.

The laws of relativity governed the motions of real bodies through real space, but they did not necessarily apply to the events of the paranormal world. To Noel Vorst, it had seemed that the only route to the stars was the extra-sensory one. So he had gathered espers of all varieties at Santa Fe, and for generations now had carried on breeding programs and genetic manipulations. The Brotherhood had spawned an interesting variety of espers, but none with the talent of transporting physical bodies through space. While on Venus the telekinetic mutation had happened spontaneously, an ironic byproduct of the adaptation of human life to that world.

Venus was beyond direct Vorster control. It, too, had come under a theocracy, but its rulers were the Harmonists, a Vorster heresy founded 75 years before by one David Lazarus. Lazarus had been quickly martyred, or so it had been thought until a dozen years ago, when his living but suspended body turned up in a crypt on Mars. Technicians at Santa Fe had revived him, and he now was on Venus, directing the cult that had flourished so well there during his years of slumber. The Harmonists of Venus had the pushers that Vorst needed to reach into the galaxy. They showed little interest, though, in collaborating with the Vorsters on an expedition. For

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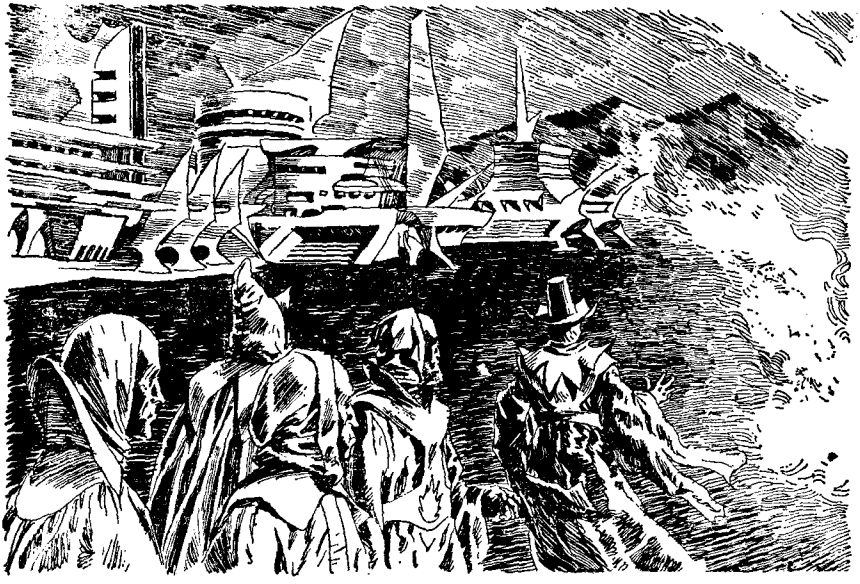

weeks, now, Reynolds Kirby had been negotiating with his opposite number on Venus, attempting to bring about an agreement.

Meanwhile the surgeons at Santa Fe had never given up their dream of creating pushers out of Earthmen, thus making the cooperation of the unpredictable Venusians unnecessary. The *synaptic - rearrangement project*, flowering at last, had come to the stage where a human subject would go under the beam.

"It wont work," Vorst had said to Kirby. "They're still fifty years away from anything."

"I don't understand it, Noel. The Venusians have the gene for telekinesis, don't they? Why can't we just duplicate it? Considering all we've done with the nucleic acids — "

Vorst smiled. "There's no 'gene for telekinesis' as such, you know. It's part of a constellation of genetic patterns. We've been trying consciously to duplicate it for thirty years, and we aren't even close. We've also been trying a random approach, since that's how the Venusians got the ability. No luck there either. And then there's this synapse business: alter the brain itself, not the genes. That may get us somewhere, eventually. But I can't wait another fifty years."

"You'll live that long, surely."

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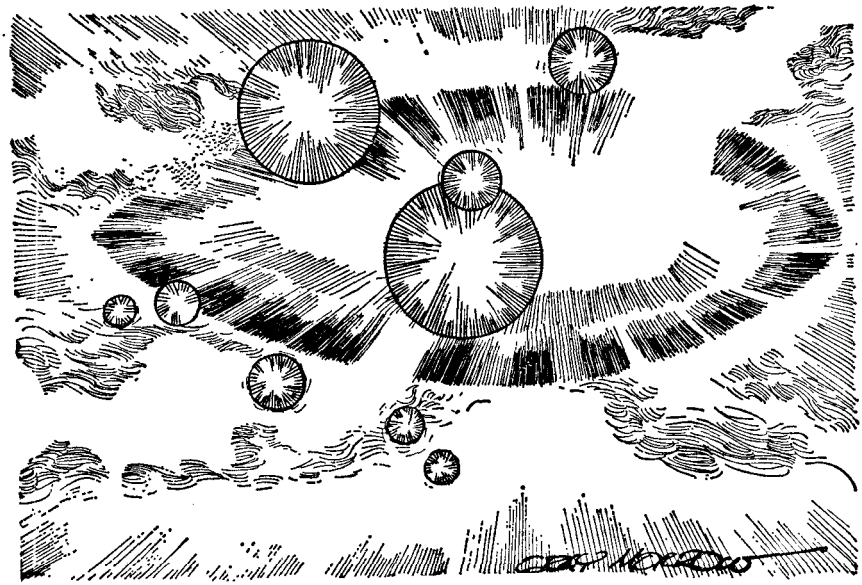

"Yes," Vorst agreed, "but I still can't wait any longer. The Venusians have the men we need. It's time to win them over."

Patiently Kirby had wooed the heretics. There were signs of progress in the negotiations, now. In view of the failure of the operation, the need for an agreement with Venus was more urgent.

"Come with me," Vorst said, as the dead patient was wheeled away. "They're testing that gargoyle today, and I want to watch."

Kirby followed the Founder out of the amphitheater. Acolytes were close by in case of trouble. Vorst, these days, rarely tried to walk any more, and rolled along in his cradling net of webfoam. Kirby still preferred to use his feet, though he was nearly as ancient as Vorst. The sight of the two of them promenading through the plazas of the research center always stirred attention.

"You aren't disturbed over the failure just now?" Kirby asked.

"Why should I be? I told you it was too soon for success."

"What about this gargoyle? Any hope?"

"Our hope," Vorst said quietly, "is Venus. They already have the pushers."

"Then why keep trying to develop them here?"

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"Momentum. The Brotherhood hasn't slowed down in a hundred years. I'm not closing any avenue now. Not even the hopeless ones. It's all a matter of momentum."

Kirby shrugged. For all the power he held in the organization — and his powers were immense — he had never felt that he held any real initiative. The plans of the movement were generated, as they had been from the first, by Noel Vorst. He and only he knew what game he was playing. And if Vorst died this afternoon, with the game unfinished? What would happen to the movement then? Run on its own momentum? To what end, Kirby wondered?

They entered a squat, glittering little building of irradiated green foamglass. An awed hush preceded them: Vorst was coming! Men in blue robes came out to greet the Founder. They led him to the room in the rear where the gargoyle was kept. Kirby kept pace, ignoring the acolytes who were ready to catch him if he stumbled.

The gargoyle was sitting enmeshed in lacy restraining ribbons. He was not a pretty sight. Thirteen years old, three feet tall, grotesquely deformed, deaf, crippled, his corneas clouded, his skin pebbled and granulated. A mutant, though not one produced by any laboratory; this was Hurler's Syndrome, a natural and congenital error of metabolism, first indentified scientifically two and a half centuries before. The unlucky parents had brought the hapless monster to a chapel of the Brotherhood in Stockholm, hoping that by bathing him in the Blue Fire of the cobalt reactor his defects would be cured. The defects had not been cured, but an esper at the chapel had detected latent talents in the gargoyle, and so he was here to be probed and tested. Kirby felt a shiver of revulsion.

"What causes such a thing?" he asked the medic at his elbow.

"Abnormal genes. They produce metabolic error that results in an accumulation of mucopolysaccharides in the tissues of the body."

Kirby nodded solemnly. "And is there supposed to be a direct link with esping?"

"Only coincidental," said the medic.

Vorst had moved up to study the creature at close range. The Founder's eye-shutters clicked upward as he peered forward. The gargoyle was humped and folded, virtually unable to move its limbs. The milky eyes held a look of pure misery. To the euth-

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anasia heap with this one, Kirby thought. But yet Vorst hoped that such a monster would take him to the stars!

"Begin the examination," Vorst murmured.

A pair of espers came forward, general-purpose types: a slick young woman with frizzy hair, and a plump, sad-faced man. Kirby, whose own esping facilities were deficient to the point of nonexistence, watched in silence as the wordless examination commenced. What were they doing? What shafts were they aiming at the huddled creature before them? Kirby did not know, and he took comfort in the fact that Vorst probably did not know either. The Founder wasn't much of an esper himself.

Ten minutes passed. Then the girl looked up and said, "Low-order pyrotic, mainly."

"He can push molecules about?" Vorst said. "Then he's got a shred of telekinesis."

"Only a shred," the second esper said. "Nothing that others don't have. Also low-order communication abilities. He seems to be sitting there telling us to kill him."

"If it were up to me, I'd recommend dissection," said the girl. "The subject certainly wouldn't mind."

Kirby shuddered. These two bland espers had peered within the mind of that crippled thing, and that in itself should have been enough to shrivel their souls. To see, for an empathic moment, what it was like to be a thirteen-year-old human gargoyle, to look out upon the world through those clouded eyes — ! But they were all business, these two. They had merged minds with monstrosities before.

Vorst waved his hand. "Keep him for further study. Maybe he can be guided toward usefulness. If he's really a pyrotic, take the usual precautions."

The Founder whirled his chair around and started to leave the ward. At that same moment an acolyte came hurrying in, bearing a message. He froze at the unexpected sight of Vorst wheeling toward a collision with him. Vorst smiled paternally and guided himself around the boy, who went limp with relief.

The acolyte said, "Message for you, Coordinator Kirby."

Kirby took it and jammed his thumb against the seal. The envelope popped open, seemingly of its own volition.

The message was from Mondschein .

"LAZARUS IS READY TO TALK TO VORST," it said ominously.

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III

Vorst said, "I was insane, you know. For something like ten years. Later I discovered what the trouble was. I was suffering from time-float?"

The pallid esper girl's eyes were very round as she gazed at him. They were alone in the Founder's personal quarters. She was thin, loose-limbed, thirty years old. Strands of black hair dangled like painted straw down the sides of her face. Her name was Delphine, and in all the months that she had served Vorst's needs she had never become accustomed to his frankness. She had little chance to; when she left his office after each session, other espers erased her recollection of the visit.

She said, "Shall I turn myself on?"

"Not yet, Delphine. Do you ever think of yourself as insane? In the difficult moments, the moments when you start ranging along the time-line and don't think you'll ever get back to now?"

"It's pretty scary sometimes."

"But you get back. That's the miraculous thing. You know how many floaters I've seen burn out?" Vorst asked. "Hundreds. I'd have burned out myself, except that I'm a lousy precog. Back then, though, I kept breaking loose, drifting along the time-line. I saw the whole Brotherhood spread out before me. Call it a vision, call it a dream. I saw it, Delphine. Blurred around the edges."

"Just as you told it in your book?"

"More or less," said the Founder. "The years between 2055 and 2063 — those were the years I had the visions worst. When I was 35, it started. I was just an ordinary technician, a nobody, and then I got what could be called divine inspiration, except all it was was a peek at my own future. I thought I was going crazy. Later I understood."

The esper was silent. Vorst shuttered his eyes. The memories glowed in him: after years of internal chaos and collapse, he had come from the crucible of madness purified, aware of his purpose. He saw how he could reshape the world. More than that: he saw how he *had* reshaped the world. After that, it was just a matter of making the beginning, of founding the first chapels, dreaming up the rituals of the cult, surrounding himself with the scientific talent necessary to realize his goals. Was there a touch of paranoia in his purpose, a bit of Hitler, a tinge of Napoleon, a tincture of Gengis Kahn? Perhaps. Vorst complacently viewed himself as

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a fanatic and even as a megalomaniac. But a cool, rational megalomaniac, and a successful one. He had been willing to stop at nothing to gain his ends, and he was just enough of a precog to know that he was going to gain them.

He said, "It's a big responsibility, setting out to transform the world. A man has to be a little daft to attempt it or even to think he can attempt it. But it helps to know what the outcome must be. One doesn't feel so idiotic, knowing that he's simply acting out the inevitable."

"It takes the challenge out of life," said the esper.

"Ah, Delphine, you touch the gaping wound! But you'd know, of course. How dreary it is to be playing out your own script, aware of what's ahead. At least I've had the mercy of uncertainty in the small things. I can't see very much myself, so I have to hitchhike with floaters like you, and the visions aren't clear. But you see clearly, don't you, Delphine? You've been along your own world-line. Have you seen your own burnout yet, Delphine?"

The esper's cheeks colored. She looked at the floor silently.

"I'm sorry, Delphine," Vorst said. "I had not right to ask that. I retract it. Turn on for me, Delphine. Do your trick. Take me along. I've said too much today."

Shyly, the girl composed herself for her great effort. She had more control than most of her kind, Vorst knew. Whereas most of the precogs eventually slipped their moorings, Delphine had clung to her powers and her life and had reached what was, for her kind of esper, a ripe old age. She would burn out, too, one day, when she overreached herself. But up to now she had been invaluable to Vorst, his crystal ball, the most helpful of all the floaters who had aided him in plotting his course. And if she could hold out just a while longer, until he saw his route past the final obstacles, the long journey would end and they both could rest.

She released her grip on the present and moved into that realm where all moments are now.

Vorst watched, and waited, and felt the girl taking him along as she began her time-shuttling. He could not initiate the journey himself, but he could follow. Mists enfolded him, and he swung dizzily along the line of time, as he had done so often before. He saw himself, here and here, and saw others, shadow-figures, dream-figures, lurking behind the curtains of time.

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Lazarus? Yes, Lazarus was there. Kirby, too. Mondschein. All of them. the pawns in the game. Vorst saw the glow of otherness and looked out upon a landscape that was neither Earth nor Mars nor Venus. He trembled. He looked up at a tree eight hundred feet high, with a corona of azure leaves against a foggy sky. Then he was ripped away, and hurled into the stinking confusion of a rain-spattered city street, and stood before one of his early chapels. The building was on fire in the rain, and the smell of scorched wet wood assailed his nostrils. And then, smiling into the stunned parched face of Reynolds Kirby. And then —

The sense of motion left him. He slipped back into his own matrix of time, making the adrenal adjustments that compensated for his exertions. The floater lay slumped in her chair, sweat-flecked, dazed. Vorst summoned an acolyte.

"Take her to her ward," he said. "Have them work on her until she comes back to her strength."

The acolyte nodded and lifted the girl. Vorst sat motionless until they were gone. He was satisfied with the session. It had confirmed his own intuitive ideas of his immediate direction, and that was always comforting.

"Send me Capodimonte," Vorst said into the communicator.

The chubby blue-robed figure entered a few minutes later. When Vorst was in Santa Fe, one did not waste time in getting to his quarters after a summons. Capodimonte was the District Supervisor for the Santa Fe region, and was customarily in charge here except when such figures as Vorst or Kirby were in residence. Capodimonte was stolid, loyal, useful. Vorst trusted him for delicate assignments. They exchanged quick, casual benedictions now.

Then Vorst said, "Capo, how long would it take you to pick the personnel for an interstellar expedition?"

"Inter — "

"Say, for departure later this year. Run the specs off at Archives and get together a few possible teams."

Capodimonte had recovered his aplomb. "What size teams?"

"All sizes. From two persons to about a dozen. Start with an Adam-and-Eve pair, and work up to, say, six couples. Matched for health, adaptability, compatibility, skills and fertility."

"Espers?"

"With caution. You can throw in a couple of empaths, a couple of healers. Stay away from the exotics, though. And remem-

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ber that these people are supposed to be pioneers. They've got to be flexible. We can do without geniuses on this trip, Capo."

"You want me to report to you or to Kirby when I've made the lists?"

"To me, Capo. I don't want you to utter a syllable about this to Kirby or anyone else. Just get in there and run off the groups as we've already programmed them. I'm not sure what size expedition we'll be sending, and I want to have a group ready that'll be self-sufficient at any level, two, four, eight, whatever it turns out to be. Take two or three days. When you've done that, put half a dozen of your best men to work on the logistics of the trip. Assume an esper-powered capsule and go over the optimum designs.

We've had decades to plan it; we must have a whole arsenal of blueprints. Look them over. This is your baby, Capo."

"Sir? One subversive question, please?"

"Ask it."

"Is this a hypothetical exercise I'm doing, or is this the real thing?"

"I don't wnow," said Vorst honestly.

The man nodded, turned and left the room.

IV

The blue face of a Venusian looked out of the screen, alien and forbidding; but its owner had been born an Earthman, and the terrestrial heritage betrayed itself in the shape of the skull, the set of the lips, the thrust of the chin. The face was that of David Lazarus, founder and resurrected head of the cult of Transcendent Harmony. Though he was the arch-heresiarch, Lazarus owed his resurrection to the skill of his cult's rivals, the Vorsters. He owed his Venusian features to Vorster skill, too. Twelve years ago, after his dramatic return to life, the miracle-men of Sante Fe had equipped Lazarus to breathe the poisonous air of the planet where his followers now made their headquarters.

Vorst had conferred often with Lazarus in those twelve years. And always the two prophets had allowed themselves the luxury of full visual contact. It was monumentally expensive to bounce not only voices but images down the chain of relay stations that led from Venus to Earth, but expense meant little to these men. Vorst insisted. He liked to see Lazarus' transformed face as they spoke. It gave him something to focus on during the long dull-time lags in their conversations.

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Even at the speed of light, it takes a while for a message to get from planet to planet. Even a simple exchange of views took more than an hour.

Comfortable in his nest of web-foam, Vorst said, "I think it's time to unite our movement, David. We complement one another. There's nothing to gain from further division."

"There might be something to lose by union," said Lazarus. "We're the younger branch. If your reabsorbed us, we'd be swallowed up in your hierachy."

"Not so. I guarantee you that your Harmonists will remain fully autonomous. More than that: I'll guarantee you a dominant role in policy setting."

"What kind of guarantee can you offer?"

"Let that pass a moment," Vorst said. "I've got an interstellar team ready to go. They'll be fully equipped in a matter of months. I mean *fully* equipped. They'll be able to cope with anything they meet. But they have to have a way of getting out of the solar system. Give us a push, David. You've got the personnel, now. We've monitored your experiments."

Lazarus nodded, his gill-bunches quivering. "I won't deny what we've done. We can push a thousand tons from here to Pluto. We can keep the same mass going right to infinity?"

"How long to get to Pluto?"

"Fast. I won't tell you exactly how fast. But let's just say the stars are in reach. Have been for the last eight or ten months. We could get a ship there in — oh, let's call it a year. Of course, we'd have no way of maintaining contact. We can push, but we can't talk across a dozen light-years. Can you?"

"No," said Vorst. "The expedition would be out of contact the moment it got past radio range. It would have to send back a conventional relay ship to announce its safe arrival. We wouldn't know for decades. But we have to try. Give us your men, David."

"You realize it would burn out dozens of our most promising youngsters?"

"I realize. Give us your men anyway. We understand techniques for repairing burnouts. Let them push the ship to the stars, and when they drop in their tracks we'll try to fix them up again. That's what Santa Fe is for."

"First drive them to exhaustion, then patch them together?" Lazarus asked. "That's ruthless. Are the stars that important? I'd rather see these boys develop their powers here on Venus and remain intact."

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"We need them."

"So do we."

Vorst made use of the interval to flood his body with stimulants. He was tingling, palpitating with vigor by the time his reply was due. He said, "David, I own you. I made you and I want you. I put you to sleep in 2090 when you were nothing, an upstart, and I brought you back to life in 2152 and gave you a world. You owe me everything. Now I'm calling that obligation. I've been waiting a hundred years to reach this position. You people finally have the espers who can send my people to the stars. Whatever the personal cost at your end, I want you to send them."

The strain of that speech left Vorst dizzy with fatigue. But he had time to recover. Time to think, to wait for the reply. He had made his gamble, and now it was up to Lazarus. Vorst did not have many cards left to play.

The blue-faced figure in the screen was motionless; Vorst's words had not even reached Venus yet. Lazarus' reply was a long time in coming.

He said, "I didn't think you'd be so blunt, Vorst. Why should I be grateful to you for reviving me, when you jammed me in that hole in the first place? Oh, I know. Because my move-

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ment was insignificant when you took me away from it, and a major force when you brought me back. Do you take credit for that too?" A pause. "Never mind. I don't want to give you my espers. Breed your own, if you want to get to the stars."

"You're talking foolishness. You want the stars too, David. But you don't have the technical facilities, up there in the back woods, to equip an expedition. I do. Let's join forces. It's what you yourself want to do, no matter how tough you talk now. Let me tell you what's holding you back from agreeing to join me, David. You're afraid of what your own people will do to you when they find out you've agreed to cooperate. They'll say you've sold out to the Vorsters. You're frozen in a position you don't believe, just because you don't have real independence. Assert yourself, David. Use your powers. I put that planet into your hands. Now I want you to repay me."

"How can I go to Mondschein and Martell and the others and tell them that I've meekly agreed to submit to you?" Lazarus asked. "They're restless enough at having had a resurrected martyr slapped down on top of them. There are times when I expect them to martyr me again, and this time for good. I need a bargaining point."

Vorst smiled. Victory was in his grasp now.

He said, "Tell them, David, that I offer you supreme authority over both worlds. Tell them that the Brotherhood not only will welcome the Harmonists back, but that you'll be made the sole head of both branches of the faith."

"*Both*?"

"Both."

"And what becomes of you?"

Vorst told him. And once the words were past his lips, the Founder sank back, limp with relief, knowing that he had made the final move in a game a century old, and that it had all come out in the right way.

V

Reynolds Kirby was with his therapist when the summons came to go to Vorst. The Hemispheric Coordinator lay in a nutrient bath, an adapted Nothing Chamber whose purpose was not oblivion but revivification. If Kirby had chosen to escape into temporary nothingness, he could have sealed himself off from the universe and entered complete suspension. He had long since outgrown the need for such amusements, though. Now he was content to loll in the nutrient bath, restoring the vital substanc-

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es after a fatiguing day, while an esper therapist combed the snags from his soul.

Ordinarily, Kirby did not tolerate interruptions of such sessions. At his age, he needed all the peace he could get. He had been born too early to share the quasi-immortality of the younger generations; his body could not snap back to vitality the way a 22nd-century man's body could, for he had not had the benefit of a century of Vorster research when he was born. There was one exception to Kirby's rule, however: a summons from Vorst took precedence over everything, even a session of needed therapy.

The therapist knew it. Deftly he brought the session to a premature close and fortified Kirby for his return to the tensions of the world. In less than half an hour, the Coordinator was on his way to the white dome-roofed building where Vorst made his headquarters.

Vorst looked shaky. Kirby had never seen the Founder look so drained of strength. The vault of Vorst's forehead was like the roof of a skull, and the dark eyes blazed with a peculiar discomfiting intensity. A low pumping sound was evident in the room: Vorst's machinery, feeding strength to the ancient body. Kirby took the seat toward which Vorst beckoned him. Strong fingers in the upholstery grasped him and began to knead the tension out of him.

Vorst said, "I'll be calling a council meeting in a little while to ratify the steps I've just taken. But before the entire group gathers, I want to discuss things with you."

Kirby's expression was guarded. After decades with Vorst, he could supply an instant translation: *I've done something authoritarian,* Vorst was saying, *and I'm going to call in everybody to rubber-stamp an okay on it, but first I'm going to force a rubber-stamping out of you.* Kirby was prepared to acquiesce in whatever Vorst had done. He was not a weak man by nature, but one did not dispute the doings of Vorst. The last one who had seriously attempted to try was Lazarus, who had slept in a box on Mars for sixty years as a result.

Into Kirby's wary silence Vorst murmured, "I've talked to Lazarus and closed the deal. He's agreed to supply us with pushers, as many as we need. It's possible we'll have an interstellar expedition on its way by the end of the year."

"I feel a little numb at that, Noel."

"Anticlimatic, isn't it? For a

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hundred years you move an inch at a time toward that goal, and suddenly you find yourself staring at the finish line, and the thrill of pursuit becomes the boredom of accomplishment."

"We haven't landed that expedition on another solar system yet," Kirby reminded the Founder quietly.

"We will. We will. That's beyond doubt. We're at the finish line now. Capodimonte's already running personnel checks for the expedition. We'll be outfitting the capsule soon. Lazarus' bunch will cooperate, and off we'll go. That much is certain."

"How did you get him to agree, Noel?"

"By showing him how it will be after the expedition has set out. Tell me: have you given much thought to the goals of the Brotherhood once we've sent that first expedition?"

Kirby hesitated. "Well — sending more expeditions, I guess. And consolidating our position. Continuing the medical research. Carrying on with all our current work."

"Exactly. A long smooth slide toward utopia. No longer an uphill climb. That's why I won't stay around to run things any longer."

"What?"

"I'm going on the expedition," Vorst said.

If Vorst had ripped off one of his limbs and clubbed him to the floor with it, Kirby would not have been more amazed. The Founder's words hit him with an almost physical jolt, making him recoil. Kirby seized the arms of his chair, and in response the chair seized him, cradling him gently until his spasm of shock abated.

"*You're going?*" Kirby blurted. "No. No! It's beyond belief, Noel. It's madness."

"My mind's made up. My work on Earth is done. I've guided the Brotherhood for a century, and that's long enough. I've seen it take control of Earth, and by proxy I have Venus too, and I have the cooperation if not exactly the support of the Martians. I've done all I've intended to do here. With the departure of the first interstellar expedition, I will have fulfilled what I'll be so gaudy as to call my mission on Earth. It's time to be moving along. I'll try another solar system."

"We won't let you go," Kirby said, astounded by his own words. "You can't go! At your age — to get aboard a capsule bound for — "

"If I don't go," said Vorst, "there will be no capsule bound for anywhere."

"Don't talk that way, Noel. You sound like a spoiled child

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threatening to call the party off if we don't play the game your way. There are others bound up in the Brotherhood too."

To Kirby's surprise, Vorst looked merely amused at the harsh accusation. "I think you're misinterpreting my words," he said. "I don't mean to say that unless I go along, *I'll* halt the expedition. I mean that the use of Lazarus's espers is contingent on my leaving. If I'm not aboard that capsule, he won't lend his pushers."

For the second time in ten minutes Kirby was rocked by amazement. This time there was pain, too, for he was aware that there had been a betrayal.

"Is that the deal you made, Noel?"

"It was a fair price to pay. A shift of power is long overdue. I step out of the picture; Lazarus becomes supreme head of the movement; you can be his vicar on Earth. We get the espers. We open the sky. It works well for everybody concerned."

"No, Noel."

"I'm weary of being here. I want to leave. Lazarus wants me to leave, too. I'm too big, I overtop the entire movement. It's time for mortals to move in. You and Lazarus can divide the authority. He'll have the spiritual supremacy, but you'll run Earth. The two of you will work out some kind of communicant relation between the Harmonists and the Brotherhood. It won't be too hard; the rituals are similar enough. Ten years and any lingering bitterness will be gone. And I'll be a dozen light-years away, safely out of your path, unable to meddle, living in retirement. Out to pasture on World X of System Y. Yes?"

"I don't believe any of this, Noel. That you'd abdicate after a century, go swooshing off to nowhere with a bunch of pioneers, live in a log cabin on an unknown planet at age 150 — "

"Start believeing it," said Vorst. For the first time in the conversation the old whiplash tone returned to his voice. "I'm going. It's decided. In a sense, I *have* gone."

"What does that mean?"

"You know I'm a very low-order floater. That I plan things by hitchhiking with precogs."

"Yes."

"I've seen the outcome. I know how it was, and so I know how it's going to be. I leave. I've followed the plan this far — followed and led, all in one, heels over head through time. Everything I've done, I've had a hint beforehand. From founding the Brotherhood right to this moment. So it's settled. I go."

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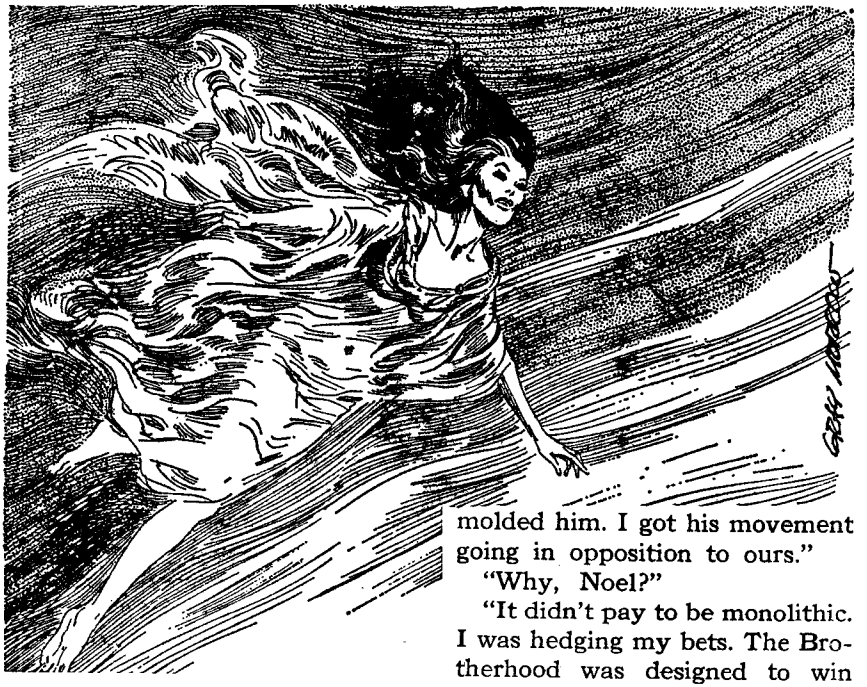

Kirby closed his eyes. He struggled for balance.

Vorst said, "Look back on the path I've traveled. Was there a false step anywhere? The Brotherhood prospered. It took Earth. When we were strong enough for a schism, I encouraged Harmonist heresy."

"*You* encouraged — "

"I chose Lazarus for what he had to do, and filled him full of ideas. He was just an insignificant acolyte, clay in my hands. That's why you never knew him in the early days. But he was there. I took him. I molded him. I got his movement going in opposition to ours."

"Why, Noel?"

"It didn't pay to be monolithic. I was hedging my bets. The Brotherhood was designed to win Earth, and it did, but the same principles didn't — couldn't — appeal to Venus. So I started a second cult. I tailored that one for Venus, and gave them Lazarus. Later I gave them Mondschein too. Do you remember that, in 2095? He was just a greedy little acolyte, but I saw the strength in him, and I nudged him around until he found himself a changed one on Venus. I built that entire organization."

"And you knew that they'd come up with pushers?" Kirby asked incredulously.

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"I didn't know. I hoped. All I knew was that setting up the Harmonists was a good idea, because I saw that it *had been* a good idea. Follow? For the same reason I took Lazarus away and hid him in a crypt for sixty years. I didn't know why, at the time. But I knew it might be useful to keep the Harmonist martyr in my pocket for a while, as a card to play in the future. I played that card twelve years ago, and since then the Harmonists have been mine. Today I played my last card: myself. I have to leave. My work is done, anyway. I'm bored with running out the skein. I've juggled everything for a hundred years, setting up my own opposition, creating conflicts designed to lead to an ultimate synthesis, and that synthesis is here, and I'm leaving."

After a long silence Kirby said, "You humiliate me, Noel, by asking me to ratify a decision that's already as immutable as the tides and the sunrise."

"You're free to oppose it at the council meeting."

"But you'll go anyway?"

"Yes. I'd like your support, though. It won't matter to the eventual outcome, but I'd still rather have you on my side than not. I'd like to think that you of all people understand what I've been doing all these years. Do you believe there's any reason for me to stay on Earth any longer?"

"We need you, Noel. That's the only reason."

"Now you're the one who's being childish. You don't need me. The plan is fulfilled. It's time to clear out and turn the job over to others. You're too dependent on me, Ron. You can't get used to the idea that I'm not going to be pulling the strings forever."

"Perhaps that's it," admitted Kirby. "But whose fault is that? You've surrounded yourself with yes-men. You've made yourself indispensable. Here you sit at the heart of the movement like a sacred fire, and none of us can get close enough to be singed. Now you're taking the fire away."

"Transferring it," said Vorst. "Here: I've got a job for you. The members of the council will be arriving in six hours. I'm going to make my announcement, and I suppose it'll shake everybody else the way it shook you. Go off by yourself for the next six hours and think about all I've just said. Reconcile yourself to it. More: don't just accept it, but *approve* of it. At the meeting, stand up and explain not simply why it's all right if I go, but why it's necessary and vital to the future of the Brotherhood that I go."

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VI

In a leafy glade on Venus, the pushers were at their sport.

An avenue of vast trees unrolled toward the pearly horizon. Their jagged leaves met overhead to form a thick canopy. Below, on the muddy, fungus-dotted ground, a dozen Venusian boys with bluish skins and green robes exercised their abilities.

At a distance several larger figures watched them. David Lazarus stood in the center of the group. About him were the Harmonist leaders: Christopher Mondschein, Nicholas Martell, Claude Emory.

Lazarus had been through a great deal at the hands of these men. To them, he had been only the name of a martyr, and they had had to adjust to his return. It had not been easy.

There had been a time when Lazarus thought they would put him to death. That time was past, now, and they abided by his wishes. But, because he had slept so long, he was at once younger and older than his lieutenants, and sometimes that interfered with the excercising of his full authority.

He said, "It's settled. Vorst will leave and the schism will end. I'll work something out with Kirby."

"It's a trap," said Emory gloomily. "Keep away from it, David. Vorst can't be trusted."

"Vorst brought me back to life."

"Vorst put you in that crypt in the first place," Emory insisted. "You said so yourself."

"We can't be sure of that," Lazarus replied, though it was true that Vorst himself had admitted the act to him in their last conversation. "We're only guessing. There's no evidence that — "

Mondschein broke in, "We don't have any reason to trust Vorst, Claude. But if he's really and verifiably aboard that capsule, what de we have to lose by pushing him to Betelgeuse or Procyon? We're rid of him, and we'll be dealing with Kirby. Kirby's a reasonable man. None of that damnable super-deviousness about him."

"It's too pat," Emory insisted. "Why should a man with Vorst's power just step down voluntarily?"

"Perhaps he's bored," said Lazarus. "There's something about absolute power that can't be understood except by someone who holds it. It's dull. You can enjoy moving and shaking the world for twenty years, thirty, fifty — but Vorst's been on top for a hundred. He wants to move along. I say take the

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offer. We're well rid of him, and we can handle Kirby. Besides, he's got a good point. Neither his side nor ours can get to the stars without the help of the other. I'm for it. It's worth the try."

Nicholas Martell gestured toward the pushers. "We'll lose some of them, don't forget. You can't push a capsule to the stars without overloading the pushers."

"Vorst has offered rehabilitation services," said Lazarus.

"One other point," Mondschein remarked. "Under the new detente, we'd have access to Vorster hospitals ourselves. Just as a purely selfish matter, I'd like that. I think the time has come to turn away from haughtiness and give in to Vorst. He's willing to check out. All right. Let him go, and look for our own advantage with Kirby."

Lazarus smiled. He had not hoped to win Mondschein's support that easily. But Mondschein was old, past ninety, and he was hungry for the care that Vorster medics could give him, care that was not to be had on rugged Venus. Mondschein had seen the Santa Fe hospitals himself, when he was a young man, and he knew what miracles they could perform. It was not a terribly worthy motive, thought Lazarus. But it was a human motive, at least, and Monschein was human behind his gills and blued skin. So are we all, Lazarus realized. Though *they* aren't.

He looked toward the pushers. They were fifth and sixth generation Venusians. The seed of Earth was in them, but they were far removed from the original stock. The genetic manipulations that had first adapted mankind for life on Venus bred true; these boys were something other than human by this time. They were intent on their games. It was little effort for them to transport objects great distances now. They could send each other around Venus virtually instantaneously, or hurl a boulder to Earth in an hour or two. What they could not do was transport themselves, for they needed a fulcrum to do their pushing with. But that was minor. They could not flit from place to place on the strength of their own powers, but they could thrust each other about.

Lazarus watched them: appearing, disappearing, lifting, throwing. Only children, not yet in full command of their powers. What strengths would be theirs when they were fully mature, he wondered?

And how many would die to send mankind beyond his pres-

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ent boundaries?

A saw-winged bird, faintly luminous in the midday dusk, shot diagonally across the sky just above the treetop canopy. One of the young pushers looked up, grinned, caught the bird and sent it whirling half a mile through the clouds. A squawk of rage, distant but audible, filtered back.

Lazarus said, "The deal is closed. We help Vorst, and Vorst goes. Done?"

"Done," said Mondschein quickly.

"Done," Martell murmured, scuffing at the grayish moss that festooned the ground.

"Claude?" Lazarus asked.

Emory scowled. He peered at a long-limbed boy, returning from a jaunt to some other continent, who materialized no more than six yards away. Emory's narrow-featured face looked dark with tension.

"Done," he said.

VII

The capsule was an obelisk of beryllium steel, fifty feet high, an uncertain ark to send across the sea of stars. It contained living quarters for eleven, a computer of uncomfortably awe-inspiring abilities and a subminiaturized treasury of all that was worth salvaging from two billion years of life on Earth.

"Prepare the capsule," Vorst had instructed Brother Capodimonte, " as though the sun were going nova next month and we had to save what was important."

Capodimonte, who had been an anthropologist before turning to the Brotherhood, had his own ideas about the contents of such an ark, but he kept them separate from his concept of what Vorst required. Quietly, a subcommittee of Brothers had planned the interstellar expedition on a someday-far-away basis decades ago, and had replanned it several times, so that Capodimonte had the benefit of the thinking of other men. That was a comfort to him.

There were troublesome elements of mystery about the project. He did not, for example, know the nature of the world to which the pioneers were bound. No one did. There was no telling, at this distance, whether it really could harbor Terran-style life.

Astronomers had founds hundreds of planets scattered through other systems. Some could dimly be picked up by telescopic sensors; others could only be inferred from computations of disturbed stellar orbits. But the planets were there. Would they welcome Earthmen?

Only one planet out of nine

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in Earth's own system was naturally habitable, not a cheering prognosis for other systems. It had taken two generations of hard work to terraform Mars; the eleven pioneers would hardly be able to do that. It had taken the highest genetic skills to convert men into Venusians; that, too, would be beyond the range of the voyagers. They would have to find a suitable world, or fail.

Espers in the Santa Fe retinue said that suitable worlds existed. They had peered into the heavens, reached forth their minds, made contact with tangible and habitable planets out there. Illusion? Deception? Capodimonte was in no position to determine that.

Reynolds Kirby, troubled by the project from first to last, said to Capodimonte, "Is it true that they don't even know what star they'll be aiming for?"

"That's true. They've detected some kind of emanations coming from somewhere. Don't ask me how. The way this thing is planned, our espers will supply the guidance and their pushers will supply the propulsion. We find, they heave."

"A voyage to anywhere?"

"To anywhere," Capodimonte agreed. "They rip a hole in the sky and shove the capsule through. It doesnt travel through normal space, whatever normal space is. It lands on this world that our espers claim to have connected with out there, and they send a message back, telling us where they are. We get the message about a generation from now. But meanwhile we'll have sent other expeditions. A one-way journey to nowhere. And Vorst is the first to take it."

Kirby shook his head. "It's hard to believe, isn't it? But evidently it's going to be a success."

"Oh?"

"Yes. Vorst had his floaters out there looking, you see. They tell him that he arrived safely. So he's willing to step out into the dark, because he knows in advance that he's not running any risks."

"Do you believe that?" asked Capodimonte, shuffling through his inventory sheets.

"No."

Neither did Brother Capodimonte. But he did not quarrel with the role assigned to him. He had been at the council meeting where Vorst had announced his stunning intention, and he had heard Reynolds Kirby rise and eloquently argue the case for allowing the Founder to depart. Kirby's thesis had been a sound one, within the context of

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nightmare that this whole project embraced. And so the capsule would leave, powered by the joint efforts of some blue-skinned boys, and guided on a thread through the heavens by the roving minds of Brotherhood espers.

And Noel Vorst would never walk the Earth again.

VIII

It was the day of departure. Chill winter winds raked New Mexico on this late-December day. The capsule stood in a desert flat a dozen miles from the inner compound of the Santa Fe research center. From here to the horizon it was a wilderness of sagebrush and juniper and pinyon pine; and in the distance the bowl of mountains rose. Though he was well insulated, Reynolds Kirby shivered as the wind assailed the plateau. In another few days, the year 2165 would be dawning, but Noel Vorst would not be here to welcome it. Kirby was not accustomed to that idea yet.

The pushers from Venus had arrived a week ago. There were twenty of them, and since it was inconvenient for them to live in breathing-suits all their time on Earth, the Vorsters had erected a little bit of Venus for them. A domed building not far from the capsule housed them; it was pumped full of the poisonous muck that they were accustomed to breathing. Lazarus and Mondschein had come with them, and were under the dome now, getting everything prepared.

Mondschein would remain after the event, to undergo an overhauling in Santa Fe. Lazarus was going back to Venus in a couple of days. But first he and Kirby would face each other across a conference table and hammer out the first clauses of the new entente. They had met once, twelve years ago, but not for long. Since Lazarus' arrival on Earth, Kirby had spoken briefly to him, and had come away with the feeling that the Harmonist prophet, though strong-willed and purposeful, would not be difficult ultimately to reach understandings with. He hoped not.

Now, on the wintry plateau, the high leaders of the Brotherhood of the Immanent Radiance were gathering to watch their leader vanish. Kirby, glancing around, saw Capodimonte and Mangus and Ashton and Langholt and all the others, dozens of them, spiralling down the echelons into the middle levels of the organization. They were all watching him. They could not watch Vorst, for Vorst was in the capsule already, along with the other members of the expedi-

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tion. Five men, five women, and Vorst. All of the others under forty, healthy, capable, resilient. And Vorst. The Founder's quarters aboard the capsule were comfortable, but it was lunacy to think of that old man plunging into the universe like this.

Supervisor Mangus, the Euuropaan Coordinator, stepped to Kirby's side. He was a small, sharp-featured man who, like most of the other leaders of the Brotherhood, had served in its ranks over seventy years.

"He's actually going," Mangus said.

"Soon. Yes. No doubt of it."

"Did you speak to him this morning?"

"Briefly," Kirby said. "He seems very calm."

"He seemed very calm when he blessed us last night," said Magnus. "Almost joyful."

"He's putting down a great burden. You'd be joyful too if you could be translated into the sky and shrug off your responsibilities."

Magnus said, "I wish we could prevent this."

Kirby turned and looked bluntly at the little man. "This is a necessary thing," he said. "It must happen or the movement will founder of its own success."

"I heard your speech before the council, yes, but—"

"We've reached the fulfillment level of our first evolutionary stages," said Kirby. "Now we need to extend our mythology. Symbolically, Vorst's departure is invaluable to us. He ascends into the sky, leaving us to carry on his work and go on to new purposes. If he remained, we'd begin to mark time. Now we can use his glorious example to inspire us. With Vorst leading the way to the new worlds, we who remain can build on the foundation he bequeathes us."

"You sound as though you believe it."

"I do," said Kirby. "I didn't, at first. But Vorst was right. He said I'd understand why he was going, and I came to see it. He's ten times as valuable to the movement doing this than he would be if he remained."

Magnus murmured, "He isn't content to be Christ and Mohammed. He has to be Moses too, and also Elijah."

"I never thought I'd hear you speak of him so coarsely," said Kirby.

"I never did either," Magnus replied. "Dammit, I don't want him to go!"

Kirby was astonished to see tears glistening in Magnus' pale eyes.

"That's precisely why he's leaving," Kirby said, and then both men were silent.

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Capodimonte moved toward them. "Everything's ready," he announced. "I've got the word from Lazarus that the pushers are in series."

"What about our guidance people?" Kirby asked.

"They've been ready for an hour."

Kirby looked toward the gleaming capsule. "Might as well get it over with, then."

"Yes," Capodimonte said. "Might as well."

Lazarus, Kirby knew, was waiting for a signal from him. From now on, *all* signals would come from him. But that thought no longer disturbed him. He had adjusted to the situation. He was in command.

Symbolic regalia cluttered the field—Harmonist ikons, a big cobalt reactor, the paraphernalia of both the cults that now were merging. Kirby gestured to an acolyte, and moderator rods were withdrawn. The reactor surged into life.

The Blue Fire danced high above the reactor, and its glow stained the hull of the capsule. Cold light, Cerenkov radiation, the Vorster symbol, sparkled on the plateau, and all through the watching multitude ran the sounds of devotion, the whispered litanies, was the murmured recapitulations of the stations of the spectrum. While the man who had devised those words sat hidden within the walls of that teardrop of steel in the center of the gathering.

The flare of the Blue Fire was the signal to the Venusians in their nearby dome. Now was their moment to gather their power and hurl the capsule outward, planting man's hand on a new world in the stars.

"What are they waiting for?" Magnus asked querulously.

"Maybe it won't happen," said Capodimonte.

Kirby said nothing. And then it began to happen.

IX

Kirby had not quite known what to expect. In his fantasies of the scene, he had pictured a dozen capering Venusians dancing around the capsule, holding hands, their foreheads bulging with the effort of lifting the vehicle and hurling it out of the world. But the Venusians were nowhere to be seen; they were off in their dome, several hundred yards away, and Kirby suspected that they were neither holding hands nor showing outward signs of strain.

In his reveries, too, he had imagined the capsule taking off the way a rocket would, rising a few feet from the ground, wobbling a bit, rising a little more, sudden-

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ly soaring up, crossing the sky on a potent trajectory, dwindling, vanishing from sight at last. But that was not the way it was really to be, either.

He waited. A long moment passed.

He thought of Vorst, making landfall on some other world. An inhabited world, perhaps? What would be Vorst's impact, when he came to that virgin territory? Vorst was an irresistible force, terrifying and unique. Wherever he went, he would transform all that was about him. Kirby felt sorry for the ten hapless pioneers who would have the benefit of Vorst's immediate guidance. He wondered what kind of colony they would build.

Whatever it was, it would succeed. Success was in Vorst's nature. He was hideously old, but he had frightening vitality still locked within him. The Founder seemed to relish the challenge of beginning anew. Kirby wished him well.

"There they go," Capodimonte whispered.

It was true. The capsule was still on the ground, but now the air about it wavered, as though stirred by heat waves rising from the parched sandy soil.

Then the capsule was gone.

That was all. Kirby stared at the empty place where it had been. Vorst had been taken up into the heavens, and a gateway to somewhere had been opened.

"There is a Oneness from which all life stems," someone said gently behind Kirby. "The infinite variety of the universe we owe to—"

Another voice said, "Man and woman, star and stone, tree and bird—"

Another said, "In the strength of the spectrum, the quantum, and the holy angstrom—"

Kirby did not remain to listen to the familiar prayers, nor did he pray himself. He looked briefly at the bareness in the desert once more, and then upward at the harsh blue sky, already deepening toward nightfall. It was done. Vorst was gone, his scheming ended so far as Earth was concerned, and now it was the turn of lesser men. The way was open. Humanity could spill out across the heavens. Perhaps. Perhaps.

Alone in this great assembly of the faithful Kirby turned his back on the now sacred spot from which Vorst had made his ascent. Very slowly, a tall figure whose late-afternoon shadow stretched for yards, Kirby walked away from the place where Noel Vorst had been, and toward the place where David Lazarus was waiting for him.

—ROBERT SIVERBERG

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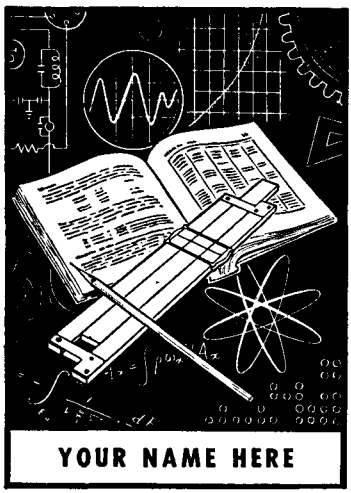

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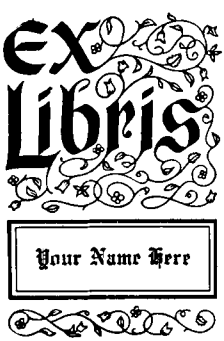

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